

December 2003

The Implications of the Local Configuration of a Standard eProcurement System on the Organisation Power Circuits

Amany Elbanna

Department of Information Systems, The London School of Economics and Political Science

Follow this and additional works at: <http://aisel.aisnet.org/bled2003>

Recommended Citation

Elbanna, Amany, "The Implications of the Local Configuration of a Standard eProcurement System on the Organisation Power Circuits" (2003). *BLED 2003 Proceedings*. 54.

<http://aisel.aisnet.org/bled2003/54>

This material is brought to you by the BLED Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in BLED 2003 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

16th Bled eCommerce Conference

eTransformation

Bled, Slovenia, June 9 - 11, 2003

The Implications of the Local Configuration of a Standard eProcurement System on the Organisation Power Circuits

Amany R. Elbanna

Department of Information Systems, The London School of Economics and Political Science
United Kingdom
A.R.El-Banna@Lse.ac.uk

Abstract

The paper presents a case study of the configuration and use of a standard e-procurement packaged software. It focuses on reviewing the new business processes that the system introduces. It, then, applies the Actor Network Theory's (ANT) notions of associations and power in order to illustrate that the new business processes introduce a new power circuit effect. In so doing, it aims to provide insight into the performing social and technical network that the newly introduced system constructs. The paper then suggests that the system configuration should not only focus on the technical functionality of the system but it should also consider how the system's new business processes would affect the social, organisational, and political architecture of the organisation and its established performing power networks.

1. Introduction

Internet based information systems and transactions have recently gained increasing attention. The boom in ERP systems has contributed to its spread, since organisations that implemented or are implementing a back office ERP system would find it appealing to complement it with a front office e-procurement system (Markus et al., 2000). E-procurement systems are believed to provide organisations with easy access to products and suppliers in addition to a faster and cost efficient process of procurement that used to be lengthy and paper intensive.

E-procurement research has been typically occupied by studying B2B and trying to see the new market relationships introduced by such a system (Lucking-Reiley & Spulber, 2000). It focuses more on the transaction costs and how to achieve the optimum economic benefits (Wigand, 1997; Garicano & Kaplan, November, 2000). The social and organisational implications of e-procurement systems have not yet received much attention. Recognising the gap, authors call for the need to explore and understand "the thorny and difficult social and organisational issues" involved in implementing and using

such systems (Chong & Liu, 2000). This research responds to such calls and aim to contribute to filling such a gap in e-commerce research.

2. Background

2.1 Social and Organisational Implications

The inner effect of the e-procurement system on the organisation has rarely received any attention. It is to some extent taken for granted and seen as unproblematic regardless of the sheer amount of research conducted in the information systems field that reveals its implementation and use to be far from straight forward (Markus, 1983; Orlikowski & Gash, 1994; Ciborra, 2000). E-procurement is claimed, arguably, to change the company view of the purchasing process from a transaction functional process to a more strategic one (Segev & Gebauer, 2001). This, in return, suggests “a massive reengineering challenge” for the purchasing processes within the organisation (Roberts, 1998) that has been rarely studied.

Evidence from previous research on IS in general reveals the significant challenge the organisation faces to introduce business processes change (Avgerou, 2000; Ciborra, 2000). Also ERP implementation research recognises the agony of implementing such systems (Allen & Kern, 2001; Davenport, 2000; Holland & Light, 1999; Hanseth & Braa, 1998). The social and organisational aspects of any newly introduced information system stand as one of the main challenges that faces its successful implementation and use (Walsham, 1993; Orlikowski, 1993; Riley & Smith, 1997; Monteiro & Hanseth, 1996). Yet these aspects have only recently caught attention in e-commerce projects. For example, Ash and Burn studied an e-commerce project for personnel management and identified some key success factors (Ash & Burn, 2001). They then asserted that environmental factors and cultural readiness are quite important in guiding such a significant change. In addition, Scacchi recognised the significant changes in the procurement process that e-commerce system could bring and suggested that concepts from BPR and e-commerce should be combined (Scacchi, 2001). He concluded by urging organisations to think of a transition path for participating people and processes.

This paper aims to extend the concern of the social and organisational aspects of e-procurement system and take it further to understand some of the implications that its local configuration could bring to the inner organisational relationships.

2.2 Networks and Power

The focus of this paper is the notion of power. It is recognised that information systems research, through the use of different frameworks, has addressed the notion of power and politics in systems implementation and how information systems change the distribution and structure of power between different groups (Keen, 1981; Markus, 1983; Kling & Iacono, 1984; Newman & Noble, 1990; Cavaye & Christiansen, 1996). Previous research also explains why some individuals or groups resist the newly introduced systems while other groups enthusiastically support and adopt it (Newman & Sabherwal, 1989). Nevertheless research has rarely focused on the details of how and why a particular configuration of the system and the related business processes trigger changes in the distribution of power within the organisation, which infuse resistance.

This study, through the application of actor network theory's (ANT) distinctive view of power, view business processes as association of managers, employees, information systems (manual or electronic), work practices, and procedures. It argues that these associations hold and restore power and channel it in a certain direction. Thus, the introduction of the e-procurement system, and the accompanied change in the business processes regarding purchasing, changes the associations between people and things and hence channel power in different direction that would not be necessarily welcomed.

To do so, the paper 'zooms into' the organisational work practices and business processes trying to detail how and why this particular system with its local configuration changed the associations between people and things which, in return, upsets the established performing power networks. It also shows how some groups found themselves in a conflict situation between two networks of power, the old one and the newly introduced one. ANT in that sense provides a different and valuable perspective for understanding and revisiting the implications of information systems.

The rest of this paper is organised as follows. The section following the introduction lays the theoretical foundation of the study and explains briefly some of the relevant notions. The second section reviews the research methodology followed by the case study. Responding to Orlikowski and Iacono's appeal to IS researchers to consider the IS in their research (Orlikowski & Iacono, 2001), the case study is divided into three parts; the first presents the implementation story, the second provides a general description of the implemented e-procurement system, and the third reviews the old and the new purchasing business processes. The fourth section provides an interpretation of the case study. The paper, then, concludes and provides some future direction for research.

3. Theoretical Underpinning

Actor network theory has recently gained considerable attention in the IS field as it holds promising potentials for IS research (Walsham, 1997). The theory has developed over time through the cooperative work and discussion of many sociologists all of whom have been associated with the Ecole de Mines de Paris (Law, 1992). Reviewing the theory itself is far from being straightforward (Latour, 1999; Walsham, 1997; Walsham, 2001), as many of its ideas and concepts are passing through constant reconsideration and development from the main gurus (Latour 1999). Yet, many notions of the theory remain unchanged as the core philosophical stance. A detailed account of them is beyond the limited size of this paper. This section briefly reviews some of the notions that are considered relevant for the purposes of this paper.

ANT believes that the social cannot do without the technical. It believes that human beings cannot keep their relationships purely social and that any relationship is a combination of the social and the technical since the technical is basically what holds the social network together and renders it durable (Latour, 1988a; Latour, 1990; Latour, 1991). It treats the social and the technical with an analytical symmetrical sense (for criticism of this stance see (Collins & Yearley, 1992). Hence any performing action is considered to be a result of an association between the social and the technical whereby the association takes the shape of a network. An actor network then is a network of humans and non-humans associated together and performs to produce certain results. For an actor to build its network, it needs to recruit, or in ANT words to 'translate', these actors' interests and align them with its own. A successful translation would lead to the establishment of a stable, irreversible network.

The theory also maintains that networks compete with one another and that the one that succeeds is the one that can successfully recruit or “translate” the interests of the others (Latour, 1987). Nevertheless, ANT recognises empty spaces where no particular network dominates or succeed in translating and pulling all the others. In this case a “fluid” space occurs where many networks exist and perform at the same time. As a response, actors constantly keep shifting association from one network to the other following no or a rather quite loose pattern (Mol & Law, 1994). This “fluidity” would continue as long as there is multiplicity of networks. It might converge into one network if one network comes to dominate and successfully translate all the others. Yet there is no necessity for the latter to take place and fluidity might continue.

ANT also holds a distinctive notion of power. It views power as the effect and product of a performing network of associations between actors. It does not see power as being out there for people to practise but as a product of social and technical relations (Law, 1996). Latour explained that power is not some kind of reservoir which people deploy, but only the result of local associations between many and varied agents (Latour, 1986; Latour, 1988b). Accordingly power does not reside with any of the actors but on the network of associations that the actor is involved in. Hence power is developed, stored, and performed through a network or ‘chain of association’ between the social and the technical (Law, 1991). In this sense it agrees with Foucault’s notion that power is exercised and not possessed (Foucault, 1979), and that power is an end result of a complex mesh of relations and not a given a priori.

4. Research Methodology

This research belongs to the qualitative school of research in information systems (Kaplan & Maxwell, 1994). It adopts an interpretive case study approach (Orlikowski & Baroudi, 1991; Walsham, 1995; Klein & Myers, 1998). The case presented here is part of a larger research project that followed the implementation of an ERP system, within which E-procurement was implemented.

The data collection of the original research project took place between February 2001 and February 2002. The main method of data collection, throughout the study, has been participant observation of most of the meetings, configuration sessions, some of the training sessions for ERP and e-procurement systems prior to its going live, and continued attendance at meetings and conducting interviews after going live. This is in addition to documents, newsletter, and project intranet review. The researcher also had free access to all project documents including “the highly restricted” internal ones. She was also copied in most e-mail communications between the project team members. Regarding e-procurement system, after going live the researcher was prohibited from attending some meetings particularly concerning the e-procurement module as people “felt the need to shout at each other in private” (a corporate service centre’s manager).

To specifically explore two departments’ experience with the e-procurement system, seventeen interviews were conducted with each department’s manager, all employees involved in the procurement process including requisitioners and approvers, a member of the core project communication team, three from the corporate service centre (a manager and two senior employees) responsible for processing purchasing orders for these departments, two consultants, a project manager, and two change managers. The organisation did not permit tape recording any of the interviews or project meetings, hence the researcher had to take notes and write down observations during the interview and extend them and add more observations directly after each interview and meeting.

5. Case Study

5.1 Implementation under the ERP Umbrella

Postal International (an anonymous name) is an international postal and courier service provider. In 2000, the organisation initiated a pilot study to explore the feasibility of buying an e-procurement package, followed by a decision to implement an organisation wide e-procurement system. Latter, the project was merged with a wider organisation programme to implement ERP. It was amalgamated to come under the management of the financial module core team following the terminations of other modules of ERP. While ERP implementation was catching attention with a wide awareness of its complexity and the change management required, e-procurement received little attention.

E-procurement configuration went smoothly and quietly as the common theme that permeated all its configuration meetings and was almost a plaque for it is that “it shouldn’t be a problem” (several project meetings) and that “it is like buying from the Internet” (consultants, project management, recurring statements in configuration sessions). Because of this the organisation went through its implementation as a straightforward task that would “deliver what it has to”. However the training decisions for ERP took a lot of discussion, e-procurement training decision was “simple” (training manager during a project meeting). It was decided that employees would receive web-based training upon being authorised to log on from their desktop computers to a special site of the company intranet to pursue the training course. The common understanding was “every one knows how to buy from the Internet” and that “it is a straight forward system” (project manager, consultants, and recurring statement in most meetings)).

From the initial presentations of the system along with all meetings afterwards, the consultants were focusing on the implementation of ERP and when it came to e-procurement, it was always introduced as “the easiest bit” because it is “like buying from the Internet”. The organisation’s vague understanding of the system was that “the system has catalogues and you find what you want, then click and buy”, and that the whole process is “deadly plain and simple”.

To the project team’s surprise, the launch of the e-procurement system did not enjoy any success. The management was surprised when the system went live as “no one gets on...” the system (a surprised change manager& laughing department manager). At first the system was avoided completely and procurements were made using the old manual system. Departments continued to use the usual manual processes of procurement regardless of the shared service centre warning of increasing their charges and its continuous complaints to the management. The service centre kept asking the management to enforce the system and “punish” whoever makes a purchase out of the system (a service centre manager in a meeting). They asked the senior management to set “a fine” as “when you park at the wrong slot, you get a ticket so why not when you use the wrong system” (a service centre manager). With many “hot and blowing” meetings with the departments involved, some got finally to put only a fraction of their purchasing orders through the system (a change manager).

The management’s consistent push to use the system resulted in a slight improvement where only 30% of procurements were put through the system while the rest continued to follow the old manual procedures. In the departments investigated, some technical complaints were raised during the first two months and even after solving all the technical issues, usage remained low. After six months, only few purchases were set over the system and the majority still set manually “out of the system” (communication manager).

What once appeared as a straightforward system that is 'like buying from the Internet' turned out to be a problematic issue, the organisation still trying to "get them to use it" and hoping that over time "they will get used to it".

5.2 System Description

The system handles the purchase of production materials and supplies for maintenance and repair in addition to services. According to the consultants the system is intended to manage the procurement process rather than only process the transactions. The system is supposed to shift the day-to-day purchasing operations towards the end-users. In general, the system automates and supports purchasing processes and facilitates products and suppliers selection through its on line catalogues. The catalogues present the products and services of organisationally approved suppliers.

The system is believed to facilitate the approval process, purchase orders processing, and reporting concerning the overall purchasing activities, suppliers' reliability, and purchasing trends and patterns. The organisation hopes to get better deals with suppliers, as it would be able to negotiate terms and conditions for all business units, which will give it a stronger negotiating position. The system is linked to an ERP package, used as the back office system, and to the suppliers via the Internet. This latter function could not be fully realised as some of the suppliers are not yet on the system and hence is substituted by printing and faxing. The system has a workflow approval routine via e-mail and provides a tracking and status check function that notifies the users with the receiving date and can be consulted for checking the status of the order.

5.3 The Purchasing Process: the Old and the New

The old process of purchasing used to be largely a manual process. In principle anyone in the department can fill in a request form. When in need of any material, a member of staff would look in suppliers' paper catalogues for the required item. If she cannot find it in any of the catalogues, or she is not sure about the specifications or the price, then she cannot complete the form. Hence she addresses the manager who, in return rings up any of the suppliers to get more information about the required item. The process then follows of completing a paper form requesting the item and specifying the suppliers among other "boxes to be filled in". This request then goes to the manager for her approval and hence 'signature'. The manager checks and approves the requested item, its price, and the other details. This form would be then faxed to the service centre that is the organisational entity responsible for raising the purchasing orders and following the financial arrangements.

In the *new process* only one person in the department is authorised access to the system that is the person who carries the corporate purchasing card namely, the requisitioner. If any member of the department, including the manager, need to buy something, she needs to submit a request to the requisitioner who would then try to find the required item on the electronic catalogues and place the order in the system. The requisitioner would open the system, looking for the supplier, the item requested, the price and set up the order. If the item requested is under a certain amount of money he is authorised to buy it directly. If it exceeds this amount, he would forward the whole request on line to an approver. The approver is set to serve many departments at once so typically he is, as a department manger expressed it, "someone God knows where" who approves "for my department". The approver sends an e-mail back to the requisitioner stating the acceptance, rejection, or amendments to the purchasing request and sends it through the system to the service centre and the supplier to pursue the purchase cycle.

6. Interpretation

Being implemented as part of the ERP implementation, the E-procurement system, in contrast to the complexity of ERP, was celebrated as being easy and straightforward, “like buying from the Internet”. This notion was significantly challenged when it faced a local well-established stable network, namely the old purchasing business process. For department managers the system is not like buying from the Internet “you don’t need approvers to buy from the Internet, do you?” (a manager). For them, it is a more complicated political issue of having external approvals, limited number of requisitioners and no direct relations with either the corporate service centre “to push an order” or the suppliers to make sure that they choose the right product.

6.1 Two Networks of Power

From the previous lengthy description of the e-procurement system and its business processes, two power networks could be identified. **The first** presents the manager’s power network represented by the old business processes and work practices. The local associations between managers, their staff, telephone, paper forms, and signage represent the managers’ performing network and source of power. The arrangement of the old purchasing business processes and work practices based on manual systems distinctively renders power and control to the managers. For example, the fact that department members fill in purchasing request forms, if in need of any materials, and seek approval from the manager position the manager in the centre of the purchasing network and stresses the powerful status- that is an important part of what constitutes a manager. Moreover, the old business processes and associations allow the manager to have an upper hand where he can follow what every member in his department is doing and also play a focal point of contact in dealing with other departments, for example if any of the staff has any query concerning an order or if the order is late, he would address the manager who in return phones the service centre to follow up. Also if the service centre has a query, their staff would contact the department manager who would address his staff.

The power of the manager concerning the purchasing function lies in the association of staff and things as presented in the old business process. Changing the associations means taking away the power of managers, which is an essential part of what constitutes a manager as the following section reveals.

The second network presents the e-procurement system’s network of power. The system with its specific configuration and business processes constructs a different network of associations and power. The new associations consist of requisitioners (as the only people from the department who are authorised to access the system), external approvers, on-line catalogues, e-mail messages, and automatic track down of the purchasing order. Thus the performed power is shared between the requisitioners and approvals away from the manager.

The business processes excluded and “prohibited” the manager from setting a purchasing request by himself, which reduces his status within his department, which was not tolerated “*even me* is not allowed to use the bloody system” (a department manager). The manager under the new processes needs to approach the requisitioner, as he is “the only one” who has access to the system, which was considered ‘humiliating’ for those of managerial status. This arrangement dissolves managers’ network regarding purchasing and suggests a different new one where the manager is almost on the periphery. This is sharply in contrast with the old arrangements that allowed a space for the manager to set orders and where all staff approach the manager to approve and follow orders.

The new system changed the whole network setting since only one person is authorised to use the system and process all purchasing requests for all the department including the manager. This sets of associations positioned the requisitioner on a powerful position in their department exceeding their managers. Then, the whole department, including the manager, needs to wait for an external approver who is working in another department. Department staff were annoyed as one expressed “I am not sure how much he knows about our work and what we buy, we sometimes buy unique stuff, not common to the whole organisation” (a member of staff). Also managers “could not see a point of asking [seeking approval] another person”, “God knows where to approve for MY DEPARTMENT” as an angry manager shouted. Another department manager also said “I cannot see a reason that we need to contact someone else to buy something for ourselves [department], I am sure that person would welcome approving for his department rather than this, it might be easier for everyone but who listen”.

6.2 Fluidity

The system network and new business processes ‘interested’ the requisitioners as they gave them a centre stage in their local departmental network since all the staff, including the manager need to approach them. It also interested the approvers who “all of the sudden” can interfere beyond the borders of their departments (an approver). The requisitioners and approvers were, then, happy to join the new network that gives them more power and attention. Yet to be enrolled in such a network, the requisitioners need to leave their older alliances and associations represented in the manager network. Requisitioners are longer required to participate in the manager network as far as purchasing is concerned, on the contrary the manager has to be only on the periphery of the requisitioners’ and approvers’ networks. The new business processes do not only break the association between the manager, requisitioners, and other department but also get rid of many of the non-human actors such as papers, telephone, paper catalogues that were previously associated with the manager. This vacuum separates the manager’s network from its inhabitants and substitutes it with the system network that assumed to mobilise some of the old alliances toward the new associations away from the old one.

However interested, the interested actors could not be mobilised towards the new network since the requisitioners had to keep their relations with the managers network due to the fact that they are physically located and working for these departments and hence should belong to their managers. The requisitioners found themselves in a critical position between two competing actor networks namely, the manager network and the system network. On one hand, the manager network performs in all aspects of the department except purchasing and on the other hand, the system network promises more power effects for them yet cannot support them beyond that. Therefore, they found themselves in fluid space between two networks were they cannot fully belong to any.

In particular, the system did not consider enrolling the managers, which left them to fight back and strive to keep their power and thus their usual allies. The managers started to create counter alliances to weaken the system network and ensure the associations of their own network. They first doubted the system and its operational value in trying to recruit the top management to their network. When they failed and were opposed by management dissatisfaction with not encouraging the requisitioners to use the system, they then seized the fact that the system was slow in the first couple of weeks of going live along with other technical problems that were resolved by the second month of going live, as a tool to interest their employees and keep them in the old network.

Subsequently with the top management pressure to put their purchases through the system, the managers asked to be authorised to log into the system and hence to be part of

the new associations “I asked them [the project team], they send me I don’t know how many pages to fill [a lengthy application form] and nothing happened until now” (a frustrated manager). With no organisational response, managers felt the threat and preserved their power through enforcing the old way of working. They strived to keep their associations and continued using the phone to call the service centre and contact the suppliers and also continued to approve orders for their staff ignoring all about the electronic system.

Until the end of the fieldwork, this fluidity continued. The organisation top management kept asserting the importance of using the system yet all the “hot and blowing” meetings seemed not to change the situation much. According to ANT, this fluidity is envisaged to last as long as no network succeeded in dominating the other. Indeed, this is the case with e-procurement system where the old network strives to keep its inhabitants and the new one seems to interest some actors yet cannot effectively mobilise them to join that network and risk leaving all the others. This tension might have been eased if the managers were first recruited to the new network.

7. Conclusion and Contributions

The study of information systems and power shifts within organisations is quite established. This paper contributes to this area by explicitly discussing and detailing the source of power. As discussed in the theory section and shown in the case study, the power of a manager could be seen as a product of associations of materially heterogeneous actors that include employees, forms, money and payment, and signage. Changes in this assembly as shown in the case study would carry the risk of changing the power structure or the “power circuits”(Clegg, 1989). For this reason, managers struggle to re-translate the actors involved and distance as many of them as possible from constructing new associations that in return will have a power effect for others away from the managers. The changes introduced and the following defence of the embedded “circuits of power” (Clegg, 1989) made this e- procurement system with its local configurations and business processes far from the expected straightforward process of “buying from the internet”.

The treatment of businesses processes as chains of associations between humans and non-humans that produce and restore power for certain actors provides an explanation of why “new technology appears suddenly to the user as an ambivalent, threatening “stranger”” (Ciborra, 1999). This insight could be useful in designing and introducing new systems since it shifts the focus from only designing a new business processes involved in systems configuration towards exploring the dynamics and the effect the new business processes could have on the power networks and eventually resistance. Mapping the power networks in the old and the new system could help in practice understanding the direction of the power shift the new system introduces and hence finding ways to address and mobilise actors from the old networks towards the new one.

The paper also reveals that technical arguments and continuous technical complaints -as seen in the case of managers- tend to disguise non-technical interests (Hanseth & Monteiro, 1997). Hence if current technical problems were solved, other problems would be likely to be found to complain about instead. Complaints then, by and large, can serve as a signalled acceptance of the status quo (Week, 2001). Therefore, the “technical subterfuge” that technical people rely on (Brooke & Maguire, 1998) can also exist in the users side to disguise more profound discontent. This suggests that technical complaints ought to be taken seriously and investigated not only from a technical perspective but also from a social and organisational perspective.

Since this paper deals with a certain e-procurement system with its particular configuration and newly designed business processes within a certain organisation, it is recognised that more research in this area is needed to explore other impacts of e-procurement systems' configurations on organisations.

However the notions of power is not new in the IS research and indeed well studied. Yet concerning e-commerce, these notions are undermined by the academics and practitioners focus on the benefits of such systems. The paper serves as a reminder that the capabilities of a standard e-procurement system are dependent on its local implementation and the change in organisational power structure that the latter brings. Local configuration of standard e-procurement systems plays, as in any information system, a crucial role on its use and accordingly the achieved benefits.

Finally, the novel framework presented in the paper would help practitioners to map the power circuits within their organisations and understand the implications of each proposed configuration of the system.

References

- Allen and Kern (2001) ERP Implementation: Stories of Power, Politics and Resistance. In IFIP Working Group 8.2 Conference on Realigning Research and Practice in Information Systems Development: The Social and Organisational Perspective, Boise, Idaho, USA.
- Ash C. and Burn J. (2001) m-Powering Personnel for e-Business Change. In ACM SIGCPR, pp 65-73, San Diego, CA.
- Avgerou C. (2000) IT and Organizational Change: An institutionalist perspective. *Information Technology & People* 13(4), 234-262.
- Brooke C. and Maguire S. (1998) Systems Development: a restrictive practice? *International Journal of Information Management* 18(3), 165-180.
- Cavaye A. and Christiansen J. (1996) Understanding IS Implementation by Estimating Power of Subunits. *European Journal of Information Systems* 5, 222-232.
- Chong S. and Liu K. (2000) The Social Aspects Neglected in E-Commerce. *Ubiquity* 1(19).
- Ciborra C.U. (2000) *From Control to Drift: The dynamic of corporate information infrastructure*. Oxford University Press.
- Ciborra C.U. (1999) Hospitality and IT. In *Informatics in the Next Millennium* (Ljungberg F., Ed), pp 161-173, Studentlitterature, Lund, Sweden.
- Ciborra C.U. (Ed.) (2000) *From Control to Drift: The dynamic of corporate information infrastructure*. Oxford University Press.
- Clegg S.R. (1989) *Frameworks of Power*. Sage, London.
- Collins H.M. and Yearley S. (1992) Epistemological Chicken. In *Science as Practice and Culture* (Pickering A., Ed), pp 301-326, The University of Chicago Press, Chicago.
- Davenport T.H. (2000) *Mission Critical: Realizing the promise of enterprise systems*. Harvard Business School Press, Boston.
- Foucault M. (1979) *Discipline and Punish: The birth of the prison*. Penguin, Harmondsworth.

- Garicano L. and Kaplan S.N. (November, 2000) The Effects of Business-to Business E-Commerce on Transaction Costs. National Bureau of Economics Research, Cambridge, MA.
- Hanseth O. and Braa K. (1998) Technology as Traitor: emergent SAP infrastructure in a global organization. In ICIS (Hirschheim R., Newman M. and DeGross J.I., Eds), pp 188-196, Helsinki, Finland.
- Hanseth O. and Monteiro E. (1997) Inscribing Behaviour in Information Infrastructure Standards. *Accounting, Management and Information Technology* 7(4), 183-211.
- Holland C.P. and Light B. (1999) Global Enterprise Resource Planning Implementation. In 32nd Hawaii International Conference on System Science, pp 1-10, Hawaii.
- Kaplan B. and Maxwell J.A. (1994) Qualitative Research Methods for Evaluating Computer Information Systems. In *Evaluating Health Care Information Systems: Methods and Applications* (Jay S.J., Ed), pp 45-68, Sage, Thousand Oaks, CA.
- Keen P.G.W. (1981) Information Systems and Organizational Change. *Communication of the ACM* 24, 24-33.
- Klein H.K. and Myers M.D. (1998) A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems.
- Kling R. and Iacono S. (1984) The Control of Information Systems Developments After Implementation. *Communications of the ACM* 27(12), 1218-1226.
- Latour B. (1986) The Powers of Association. In *Power, Action and Belief: a new sociology of knowledge* (Law J., Ed), pp 264-280, Routledge & Kegan Paul plc.
- Latour B. (1987) *Science in Action: How to follow scientists and engineers through society*. Harvard University Press, Cambridge, Massachusetts.
- Latour B. (1988a) Mixing Humans and Nonhumans Together: the sociology of a door-closer. *Social Problems* 35(3), 298-310.
- Latour B. (1988b) *The Pasteurization of France*. Harvard University Press.
- Latour B. (1990) Drawing Things Together. In *Representation in Scientific Practice* (Lynch M. and Woolgar S., Eds), pp 19-68, The MIT Press.
- Latour B. (1991) Technology is Society Made Durable. In *Sociology of Monsters: essays on power, technology and domination* (Law J., Ed), pp 103-131, Routledge, London.
- Latour B. (1999) *Pandora's Hope: Essays on the reality of science studies*. Harvard University Press, Cambridge, MA.
- Law J. (1991) Power, Discretion and Strategy. In *A Sociology of Monsters: essays on power, technology and domination* (Law J., Ed), pp 165-191, Rutledge, London.
- Law J. (1992) Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity. *Systems Practice* 5(4), 379-393.
- Law J. (1996) *The Manager and His Power*. In *Mediaset Convention*, Venice.
- Lucking-Reiley D. and Spulber D.F. (2000) *Business-to-Business Electronic Commerce*. Department of Economics, Vanderbilt University.
- Markus L.M., Petrie D. and Axline S. (2000) Bucking the Trends: What the future may hold for ERP packages. *Information Systems Frontiers*, 181-193.

- Markus M.L. (1983) Power, Politics and MIS Implementation. *Communication of the ACM* 26(6), 430-444.
- Mol A. and Law J. (1994) Regions, Networks and Fluids: Anaemia and social topology. *Social Studies of Science* 24, 641-671.
- Monteiro E. and Hanseth O. (1996) Social Shaping of Information Infrastructure: On being specific about the technology. In *Information Technology and Changes in Organizational Work* (Orlikowski W.J., Walsham G., Jones M.R. and I. D.J., Eds), pp 325-343, Chapman and Hall, London.
- Newman M. and Noble F. (1990) User Involvement as an Interaction Process: A case study. *Information Systems Research* 1, 89-113.
- Newman M. and Sabherwal R. (1989) A Process Model for the Control of Information System Development Projects. In *International Conference on Information Systems* (DeGross J., Ed), pp 185-197, Minneapolis.
- Orlikowski W.J. (1993) CASE Tools as Organizational Change: Investigating Incremental and Radical Changes in Systems Development. *MIS Quarterly* 17(3), 309-340.
- Orlikowski W.J. and Baroudi J.J. (1991) Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research* 2(1), 1-28.
- Orlikowski W.J. and Gash B.C. (1994) Technological Frames: Making sense of information technology in organizations. *ACM Transactions on Information Systems* 12(2), 174-207.
- Orlikowski W.J. and Iacono C.S. (2001) Research Commentary: Desperately seeking the "IT" in IT research-- A call to theorizing the IT artifact. *Information Systems Research* 12(2), 121-134.
- Riley L. and Smith G. (1997) Developing and Implementing IS: a case study analysis in social services. *Journal of Information Technology* 12, 305-321.
- Roberts B. (1998) Companies See Web Reengineering Procurement Practices. *Web Week*.
- Scacchi W. (2001) Redesigning Contracted Service Procurement for Internet-Based Electronic Commerce. *Information Technology and Management* 2, 313-334.
- Segev A. and Gebauer J. (2001) B2B Procurement and Marketplace Transformation. *Information Technology and Management* 2, 241-260.
- Walsham G. (1993) *Interpreting Information Systems in Organizations*. John Wiley & Sons.
- Walsham G. (1995) The Emergence of Interpretivism in IS Research. *Information Systems Research* 6(4), 376-394.
- Walsham G. (1997) Actor-Network Theory and IS Research: Current status and future prospects. In *Information Systems and Qualitative Research* (DeGross J.I., Ed), pp 467-480, Chapman and Hall, London.
- Walsham G. (2001) *Making a World of Difference: IT in a Global Context*. John Wiley & Sons, Ltd.
- Week J.R. (2001) Information Technology in a Culture of Complaint: Derogation, deprecation, and the appropriation of organizational transformation. In *Information Technology and Organisational Transformation: History, rhetoric and practice*. (Maanen J.V., Ed), Sage.

Wigand R. (1997) Electronic Commerce: Definition, theory, and context. *The Information Society* 13, 1-16.