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THE IMPACT OF NON-TECHNICAL FACTORS ON INFORMATION TECHNOLOGY STRATEGY AND E-BUSINESS

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Abstract –

IT strategy and E-business has come to stay as important issues in many organisations. They are developed and implemented for the main purpose of improving, supporting and enabling their business goals and objectives. These requirements for support and enablement of the IT strategy and E-business are increasingly present in many organisations. IT strategy and E-business are breaking old barriers and building new interconnections in what is referred to by many specialists as the emerging Global Village. IT is bringing business communities and the world at large, closer, and making the global village smaller. This paper is focused on influencing factors, whether on the development or on the implementation of IT strategy and E-business within the computing environment of an organisation. One important outcome is the new role of knowledgeable workers (people factor) and involvement in the implementation of IT strategy and E-business in organisation.

Keywords: IT Strategy, E-business ,Non-technical factors.

1 INTRODUCTION

Increasingly in organisations, E-business is treated as an element of the IT strategy. This paper adopts the same approach. IT strategy and E-business could be seen as a perspective, position, plan, or pattern which provides guidance for actions to be taken and, at the same time, is shaped by the actions already taken. Has it actually worked? IT strategy has been used to attempt to bridge the gap between the business vision and strategy on the one hand, and technological know-how on the other hand. There is, however, clearly still a problem with IT strategy and E-business formulation and implementation, otherwise, work would not continue in this area

2 RESEARCH APPROACH

The research from which this paper is produced adopted an interpretive, dual case study methodology to investigate the impact of non-technical factors on IT strategy within the computing environment in the two organisations. The two case studies were adopted to gain an insightful, qualitative interpretation of what is happening in the development and implementation of IT strategy.

The research employed a qualitative methodology to study the impact of non-technical factors on IT strategy and E-business. Qualitative research is more suitable for this type of study as it allows clarification of questions when asking respondents to explain (“Who”, “What”, “How”, “When”, “Where” and “Why”) (Myers, 1998). Qualitative research is argued and described as a very useful method for complex situations and theories (Boucaut, 2001).

A set of balanced respondent demographics was a key factor in achieving a true reflection of the situations. Respondents were at various levels of the structure within the Business and IT departments. They included IT Technicians, Analysts, IT Managers, IT Project Managers, IT Executives and IT Directors.

The research employed Structuration Theory (ST) Callon and Law (1989) and Actor-Network Theory (ANT) Giddens (1984) for the analysis and interpretation of the two case studies at two different levels: through the ‘duality of structure’ concept of ST, and the concept of ‘translation’ of ANT.

3 METHODOLOGY

IT strategy cannot be formulated in isolation and it depends on the acceptance and interest of the employees, including the managers, of the organisation. One of the motivations for this study is as stated above – that IT strategy often focuses almost exclusively on the non-human elements Boar (1998). What they do not debate, but is often the deciding variable in strategy success, is the non-technical elements of IT strategy, and, in particular, the issue of building and sustaining organisational commitment to the formulated technology strategy. Most Chief Information Officers (CIOs) would argue that IT strategy provides the vision for the organisation to march into the future along with retaining its own identity, and to create and establish sustainability. Very little emphasis is placed on the non-technical aspects such as process and people.

4 COMPONENTS OF IT STRATEGY

There are basic components which are common to both the development and implementation of IT strategy. These components include technology, process and people Mark (2002). They are key to the development and implementation, and as such, could contribute to success or failure of IT strategy. The paper exhume the importance of non-technical elements of IT strategy and as such, defines it as follow:

“IT strategy is the technical design which serves as the road map over a period of time for the implementation of information technology and information systems by people using a formal process.”

“Fig. 1” below illustrates the definition above and how the three components of IT strategy are interconnected. Each of the components are explained below, however, the paper focuses on the non-technical components.

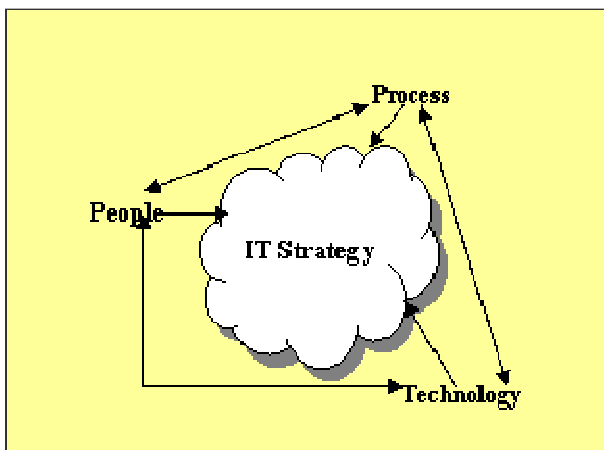


Figure 1. Components of IT Strategy

6.1 Technology Component

This component of the IT strategy consists of the technology artefacts. It determines the technological solutions based on the organisation’s goals and objectives, through its information systems strategy.

Also, the technology component provides technology options needed to support and enable the organisation's objectives. The technology component includes both software and hardware.

Implementers are very influential in determining the success or failure of IT strategy Sangbae (2003). Their influence is often political, and an accepted IT strategy is not guaranteed to be the most successful, or better than another strategy.

6.2 Process Component

Process is the component of IT strategy that opens up the possibilities for the development and implementation of IT strategy. Process creates a roadmap for IT strategy development and implementation. According to Mooney et al. (1996) process is a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and expected outputs.

6.3 People Component

The development and implementation of IT strategy are conducted through processes, which are formulated by people. As such, the success or failure of the IT strategy greatly depends on people who are involved and undertake these responsibilities. Orlikowski and Gash (1994) argue that an understanding of people's interpretations of a technology is critical to understanding their interaction with it. To interact with technology, people have to make sense of it; and in this sense-making process, they develop particular assumptions, expectations, and knowledge of the technology, which then serve to shape subsequent actions towards it.

People act on the basis of their interpretations and this drive and determine the capabilities of the technology, the process of using the technology and the outcomes of the technology. People's willingness to accept or reject the IT strategy will therefore be highly influential in the outcome of the IT strategy and as such, should be taken into consideration. It is inevitable that people are influenced and driven by different forces, in the organisations.

IT strategy, therefore, is not only about information and technology, strategic direction and choices. It requires the involvement of people. People have different beliefs and understanding, which is likely to have an impact on the development and implementation of IT strategy. People are not only connected within the organisation, but they are also connected to other people outside the organisation, which results in further different influences and interests coming into play

5 METHODOLOGY

This paper is underpinned by the theories of Structuration and Actor-Networks. This means more than that the paper was just 'guided' by these theories. The data that was collected in the empirical phase of the research study, the analysis of the data, and the subsequent interpretation of the results were undertaken using the ontological and epistemological bases implied by the underpinning theories. This aspect is elaborated on in section 2, Research Approach above.

Structuration Theory, according to Rose (1998), "seeks to show how the knowledgeable actions of human agents discursively and recursively form the sets of rules, practices and routines which, over time and space constitutes ... structure". Structuration Theory proposes a duality of structure, which means that the structural properties of social systems, which include both rules and resources, are both the medium and the outcome of the practices they recursively organise. The structural properties of social systems do not exist outside of action but are chronically implicated in its production and reproduction Giddens (1984). Thus, structure and action are recursively dependent on each other

Orlikowski and Robey (1991). Social activity (agency) and structure (rules and resources) exist in a dual relationship with each other such that they tend to produce and reproduce each other in an ongoing cycle.

An actor-network consists of actors linked together through various interests. Actor-network theory is a highly influential theory within the sociology of science that seeks to explain and interpret social and technological developments. ANT gives privilege to neither technical nor non-technical factors. Instead, it incorporates a “principle of generalised symmetry”, where both human and non-human elements are considered actors or actants and both elements are capable of affecting each other. ANT emphasises the heterogeneous nature of actor networks which consist of and link together both technical and non-technical elements Callon (1991).

ANT focuses on how people and objects are brought together in stable, heterogeneous networks of aligned interests through processes of translations and negotiations (Callon, 1986; Law, 1991; and Callon and Law 1989). Latour (1996) emphasises that heterogeneous networks overcome issues related to identity, and avoid arbitrary dichotomies and structures.

Jones (1999) classified the uses of Structuration Theory in IS research into four main types: (i) The modification of the theory to accommodate the construct of technology, e.g., the structural model of technology Orlikowski (1992). (ii) The application of the theory to analyse IS cases and to explore the theory’s strengths and limitations in empirical research. (iii) Its use as a meta-theory, a general approach to look at actions, perceptions and structure and their interconnections.

A selection of Giddens’ concepts in combination with newer theories such as Actor-Network Theory to guide IS research Walsham and Sahay (1999). According to Monteiro and Hanseth (1996), ANT is an effective way of describing how minute, technical design solutions are interwoven with organisational issues. Walsham (1997) describes Actor-Network Theory as both a theory and a methodology, in that it allows the empirical researcher to trace and document: network elements, processes of translation and inscription, the creation of black boxes or immutable mobiles and the degree of stability and irreversibility of networks and their elements.

Given the above, using Structuration Theory and Actor Network Theory, the analysis focused on the interaction or social practice involving the development and implementation and how the 'actor-network' grows, changes and stabilises during development and implementation of IT strategy, respectively

6 RESULT

6.1 The Importance of Human Interactions

The analysis revealed that human interaction was very important in the development and implementation of IT strategy in the organisation. Through interactions, understanding was gained, allocated tasks were communicated and information was shared between the actors involved in the development and implementation of IT strategy. At the same time, poor interaction between the top level and the lower levels meant that lower ranked employees in general had a poor understanding of the developed IT strategy, which affected the implementation of the IT strategy.

While employees in the computing environment have a common understanding of the aims and objectives of IT strategy in the organisation, they do not necessarily have the same understanding and interpretation of the development and implementation of IT strategy. In particular, with respect to implementation, the way in which the developed IT strategy was communicated to employees affected their interest and fuelled the pursuit and protection of self-interests.

The working relationship among the employees, including the management in the computing environment, was influenced by diverse human interests, intentions and actions. A good working

relationship among the employees was vital due to the interdependency of individual tasks, activities, responsibilities and accountabilities when implementing the IT strategy.

The computing environment consisted of employees of several races – whites, blacks, coloureds and Indians. White males were in the majority and the minority of employees were black people. Even though all processes and activities of the organisation were non-racist, racial domination was prevalent, and it became an influencing factor in the implementation of IT strategy in the organisation. Racial domination played itself out in the organisation because the employees who indulged in such acts were able to associate themselves with the dominant actors in the computing environment, such as heads of autonomous departments.

Some employees resorted to racial discrimination to ingratiate themselves with superiors including colleagues of the same racial identity because they lacked confidence in their talents and skills. As a result of these actions, employees who did not belong to this racial group could not enrol in some of the activities during the development and implementation of IT strategy.

There was a lack of racial integration and trust among the employees. As a result, negative relationships existed among the employees in the computing environment. Some members of the white race at times excluded employees of other races in communicating some of the processes and activities in the development and implementation of IT strategy. Similarly, some of the people of the black, coloured and Indian races segregated themselves from the white race, which made it difficult for them to be interested in and enrolled in the allocation of tasks.

6.2 The Organisational Rules and Hierarchy

Based on the organisational rules, all employees were within the hierarchy of the organisation and as such, irrespective of individual interests, all levels of employees were within the structures of the hierarchy. The organisational hierarchy was a determining criterion for the allocation of roles and responsibilities. In turn, larger parts of tasks were allocated according to roles and responsibilities of the actors involved in the development and implementation of IT strategy in the organisation.

Employees' actions, which the organisational hierarchy allows for, had an impact on IT strategy. For example, certain decisions were not made in the absence of the CIO except when they had been delegated by the CIO, and only the IT managers who report directly to the CIO could be appointed or delegated to act on his behalf. This was accepted by the rest of the employees.

One department head indicated that he preferred other departments to perform poorly so that his department could dominate others and be seen as being more productive and hence be awarded more incentives. In the same vein, more and more managers responded to such ideas, which created a prevalence of competitiveness and rivalry fuelled by the need to gain advantage in the computing environment of the organisation. Employees typically followed the lead of their various managers.

Most of the actions of the employees were deliberate, in the full awareness that their actions could lead to either success or failure of the technology in the organisation.

The personal interests of the different departments were therefore dominant and controlled the implementation of IT strategy in the organisation. This ultimately wielded the greatest influence over the trajectory of initiative and innovation. Departments were not able to accept each other and were not able to see the impact of integration, a collaborative approach and dependencies. As such, each department created a barrier in the implementation of IT strategy in the organisation.

6.3 The Effect of Autonomy

Some employees have greater access to more resources and knowledge or information than others. These individuals drew from different structures or from the same structures in ways which gave them an advantage, not only with respect to their peers, but also with respect to their superiors. This is what Giddens call the dialectic of control in a social system:

“Power within social systems which enjoy some continuity over time and space presumes regularised relations of autonomy and dependence between actors or collectivities in contexts of social interactions. But all forms of dependence offer some resources whereby those who are subordinate can influence the activities of their superiors” Giddens (1989)

The autonomy of managers also allowed them to interpret the implementation tasks differently, depending on the interest of the head concerned. IT managers used the mandates and authority bestowed on them to share the information they received and their interpretation thereof as they pleased and in the process, imposed constraints on the performance of those who were not privileged or favoured by them. Such actions were informed by personal interests, exploited the performance contracts of employees and prevented employees from carrying out tasks that they (the managers) would prefer not to undertake.

Also, there was a pervasive and accepted rule in the organisation that dictated that subordinates at all times had to obey their managers, which allowed for all IT employees to accept IT strategy without objection. This means that a manager at any level is able to prevent aspects of the IT strategy from being implemented and all employees at a lower level will oblige to comply with the decisions made by the manager. Therefore, resistance of any type was limited when it came to complying with dictates of the IT strategy.

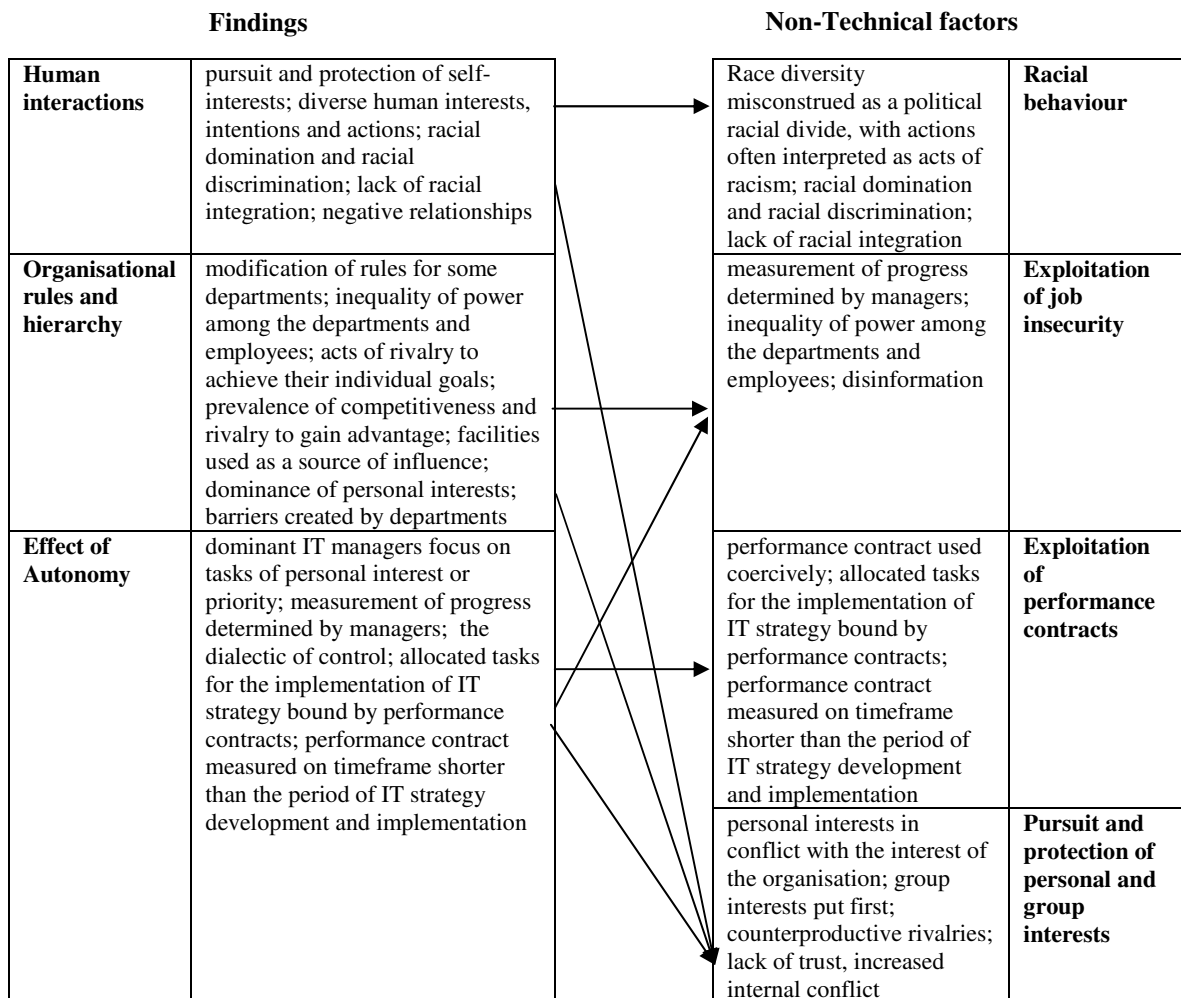


Figure 2. Impact of non-technical factors on IT strategy

Racially motivated actions occurred at all levels. Managers, using their discretion as mandated by the rules that allowed for a flexible approach in the allocation of tasks in the organisation, would allocate

more resources and tasks to certain individuals than to their colleagues, who were at the same level in the organisational hierarchy, and these actions were often racially motivated. Some employees resorted to racial discrimination to ingratiate themselves with their superiors. Others would exclude members of another race when communicating information related to the implementation of IT strategy. These racially motivated actions divided the workforce, was not conducive to productivity and had a serious impact on the implementation of the IT strategy.

“I can use our team as an example the manager has been reporting that everything is fine because his bonus depends on it; but when internal audit came and measured the effectiveness, it came out as a red so what he is saying versus what has proven to be the case are two different things.”

Managers exploited performance contracts by using their power to decide how to measure employees' performances. With appraisals in terms of the individual employee's performance contract also measured on a timescale shorter than the period of IT strategy development and implementation, employees resorted to seeking the approval of their managers instead of focusing on the task at hand. The unequal distribution of power among the different departments, the unhealthy competitiveness and rivalries to gain personal advantage meant that employees and managers alike were constantly insecure about what they had to do and about their jobs as such. This situation was not improved by acts of disinformation or non-information, which, as pointed out above, were often racially motivated. Some employees were dominated by others, excluded and deprived of the resources needed to do their job, adding to their insecurity. The impact of this on the implementation of the IT strategy cannot be underestimated. An example is as miserably asserted by a senior manager in the organisation:

“Some people don't like working with other people. My case is an example. Some people do not like working with me. The reasons are partly a power struggle, partly ignorance, personal and staff capabilities.”

IT managers, especially heads of departments, also promoted their individual interests through the facility to allocate and authorize the use of available resources. This act was prevalence in during the development and implementation of the IT strategy as confirmed by many of the employees, such as, one of the employees put it:

“Some staff support and as such are interested in the IT strategy mainly because it personally benefits them. On the other hand, some people reject the IT strategy in any form due to the fact that it seems to alienate or does not benefit them.”

These actions unavoidably led to counterproductive rivalries, where personal and group interests, often in conflict with the interests of the organisation, were put first. The driving force behind this pursuit of individual and group interests was often the feeling of superiority of one manager or a particular group over others. This had a negative effect on employees and increased the job insecurity of many of the employees, particularly, those at the lower levels in dominated departments or groups. It led to reduced productivity, created a lack of trust, increased internal conflict and negatively affected the implementation of IT strategy in the organisation.

7 CONCLUSION

It led to reduced productivity, created a lack of trust, increased internal conflict and negatively affected the implementation of IT strategy in the organisation. The non-technical factors as captured and illustrated in “Fig 2” above, derailed processes and activities during the implementation of IT strategy in the organisation. As a result of the derailment, IT strategy is developed or reviewed each year, making it a cost prohibitive exercise.

During implementation of the developed IT strategy, employees are mobilised by their managers to undertake the implementation of aspects of the IT strategy by allocating these as tasks to them. Communication is restricted, and the focus is on technical aspects. These communicative actions reproduce structures of significance, which are that technical aspects receive priority, regardless of

their match with particular aspects of the developed IT strategy. Employees use their technical abilities and managers their authority to protect their own interests. These actions produce and reproduce the structures of domination, dictating implementation based on pragmatic considerations. Finally, employees accept their tasks, coupled as they are to performance related incentives, and continue with their work without full understanding of the developed IT strategy. Their work is affected by a variety of issues which create an environment of poor cooperation. All of this reproduces the structure of legitimation that employees at lower levels, who have not been involved in the development of the strategy, will implement the strategy.

Due to the relative instability of the actor-networks in the two case studies, implementation of the IT strategy can be expected to become increasingly difficult in time. As pointed out before, the actions of agents always carry within them the seeds of change, but such change, to improve the alignment and hence the stability of the networks, would also require a change in the processes to create new norms, facilities and interpretive schemes. As mediators of the actions of agents, they could contribute to new structures of legitimation, domination and signification, which in turn could lead to a better translation of interests of the actors in the network. The findings from the analysis represent the current regularity in practice, which is likely to continue unless an effort is made to change it.

References

- Myers, M. D. (1998). Interpretive Research in Information Systems, In: M. Mingers & F. Stowell, (eds.), *Information Systems: An Emerging Discipline?*, McGraw-Hill, London; Maidenhead.
- Boucaut, R. (2001). Understanding workplace bullying: A Practical Application of Giddens' Structural Theory, *International Education Journal*, vol. 2, no. 4, pp. 65 - 73.
- Callon, M. and Law, J. (1989). On the Construction of Sociotechnical Networks: Content and Context Revisited. *Knowledge and Society: Studies in the Sociology of Science Past and Present*, vol. 8, pp. 57-83.
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Cambridge, UK; John Polity Press.
- Boar, H. (1998). *Information Technology Strategy as Commitment*. RCG Information Technology. Available: <http://www.rcgit.com/Default.aspx>. Accessed 02 December 2004.
- Mack, R. (2002). *Creating an Information Technology (IT) Strategy: An Alternative Approach*, Gartner, Inc., Available: www.gartner.com. Accessed June 28 2004.
- Sangbae, K. (2003). *The Global Politics of Information*. Available: <http://myhome.hanafos.com/~sangkim414/index-e.html>. Accessed 28 October 2004.
- Mooney, G Gurbaxani, H. V. and Kraemer, L. K. (1996). A Process Oriented Framework for Assessing the Business Value of Information Technology, *ACM SIGMIS Database*, vol. 27, no. 2, pp. 68 – 81.
- Orlikowski, W. and Gash, D. (1994). Technological Frames: Making Sense of Information Technology in Organisations, *ACM Transactions on Information Systems*, vol. 12, no. 2, pp. 174 - 207.
- Rose, R. (1998). Evaluating the contribution of Structuration Theory to the Information Systems discipline, In: *Proceedings of the 6th European Conference on Information Systems (ECIS)*, Aix-en-Provence, France.
- Orlikowski, W. and Robey, D. (1991). Information Technology and the Structuring of Organizations, *Information Systems Research*, vol. 2, no. 2, pp. 143 - 169.
- Callon, M. (1991). Techno-economic networks and irreversibility. In: J. Law, (ed.), *A sociology of monsters. Essays on power, technology and domination*, pp. 132 – 164. London; Routledge.
- Callon, M. (1986). Some elements of the sociology of translation: Domestication of the scallops and the fisherman of St Brieuc Bay. In: J. Law, (ed.), *A New Sociology of Knowledge, power, action and belief*, pp.196 – 233. London, Routledge.
- Law, J. (1991). Monsters, Machines and Sociotechnical Relations. In: *A Sociology of Monsters: Essays on Power, Technology and Domination*, J. Law, (ed.), pp 1 – 23. London; Routledge.

- Latour, (1996). Social Theory and the Study of Computerised Work Sites, In: Information Technology and Changes in Organizational Work, W. J. Orlikowski, G. Walsham, M. R. Jones, & J. I. DeGross, (Eds.), pp. 295 – 307. London; Chapman & Hall.
- Jones, M. (1999). Structuration Theory. In: W. L. Currie & R. D. Galliers, (Eds.), Rethinking Management Information Systems, pp. 103-134. United Kingdom; Oxford University Press.
- Orlikowski, W. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations, Organisational Sciences, vol. 3, no. 3, pp. 398 - 427.
- Walsham, G. and Sahay, S. (1999). GIS for district-level administration in India: problems and opportunities, MIS Quarterly, vol. 23, no. 1, pp. 39 - 66.
- Monteiro, and Hanseth, O. (1996). Social Shaping of Information Infrastructure: On Being Specific about the Technology, In: Information Technology and Changes in Organizational Work, W. J. Orlikowski, G. Walsham, M. R. Jones & J. I. DeGross, (eds.), pp. 325 – 343. London; Chapman and Hall.
- Walsham, G. (1997). Actor Network Theory and IS Research: Current Status and Future Prospects, In: Information Systems and Qualitative Research, A. S. Lee, J. Liebenau, & J. I. DeGross, (eds.), London; Chapman & Hall.
- Giddens, A. (1989). Sociology. Cambridge, UK; John Polity Press.