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## Editorial: Seeking out the links between knowledge management and electronic commerce

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## 1 Introduction

The development of Electronic Commerce (ECOM) [1] through the internet, the most challenging phenomenon of the 1990s, is at a turning point. After the failure of many 'dot.coms' the enthusiasm of the early days has been replaced by a more depressing atmosphere. However, it is the opinion of many managers and scholars that we are just at the beginning of a new phase. There is no doubt that we now have a new technology that

is capable of connecting people and organisations all around the world, and enabling the instantaneous exchange of data in different formats. The real point is that we still need to learn *how* to use such technology.

One of the main problems associated with ECOM is that nobody exactly knows what the actual benefits of such technologies are. Generally speaking, ECOM has been often seen in relation to its potential for improving the *efficiency* of communication. In practice, this implies considering ECOM as a mean for *re-allocating informational contents* that are already *available* and *explicit*. As a matter of fact, up to now, the development of ECOM has been driven by the technology industry with the (implicit or explicit) aim 'to put *any* content on the Net', so that its distribution among (business) communities becomes more efficient. This 'static' viewpoint was probably the cause for some misunderstanding. The failure of many ECOM projects can justly be traced to the difficulty with putting online existing contents. Furthermore, the actual potential of ECOM cannot be restricted to the efficient communication of existing contents but should also rest on the possibility of *creating new value from new contents*.

In short, it is clear that ECOM it is not just a question of 'selecting a technology', nor of 'transferring traditional management practices on the Net' (see terms e.g. e-marketing, e-procurement, etc.). It follows that there is the necessity for interpretative models that can explain the reasons for the success or failure of ECOM in relation to the contents that are exchanged (or should be exchanged) through the Net, and to the specific technology used. Also, new approaches are required to design and implement 'appropriate' ECOM systems, in accordance with the specific business models being implemented.

When exploring new ways of 'seeing ECOM' the recent literature tends to put a 'cognitive' interpretation on the phenomenon, in line with the latest thinking in economic and managerial disciplines. In recent years the capability of creating and making use of *knowledge* [2–6] has been increasingly recognised as a central source of competitive advantage. For this reason, there has been an upsurge of interest in topics such as knowledge creation and management, as testified by the numerous special issues, new journals and books specifically devoted to such matters [7–13].

The majority of contributions can be included in a new area of study denoted as *Knowledge Management* (KM) [14–18]. This is still an emerging field but it already has its own specific body of concepts, languages and even techniques [19], and tends to be proposed as an emerging branch of business management directly focusing on the *explicit management of knowledge*. The main topics of KM are:

- the creation of fresh knowledge in the organisations
- the storage and retrieval of available knowledge
- the sharing of knowledge among individuals and organisations
- the development and exploitation of knowledge as part of day-by-day decision making, etc. [3,4,19–21].

Although its origins can be traced to organisation studies [22], the scope of KM now extends beyond this original field and covers an area that has intersections with computer science (e.g. new computer tools and software for handling knowledge), strategic management (e.g. models of business based on KM), and studies of inter-organisational relationships (i.e. flows of knowledge between distinct firms).

## 2 Matter for a special issue

In substance, there is enough reasons to explore the interplay between KM and ECOM. The origin and practice of KM are frequently related to the great potential offered by *information and communication technologies* for the collection, elaboration, storage, and delivery of information, without space and time constraints [23]. Among these technologies, the most promising applications are ECOM systems for supporting (parts of) business transactions online. It is clear that the execution of a transaction in a market (either traditional or electronic) implies the management and exchange of *knowledge* between business partners. Consequently, ECOM through the internet is particularly relevant to KM, since such technologies are deemed to make the exchange, delivery and processing of knowledge easier and faster [24–26].

In addition, there are various crucial questions in the use of the internet and ECOM that explicitly recall KM issues. For instance, although the internet and the World Wide Web represent a potential immense source of knowledge for business activities, the rapid and chaotic development of this environment has led to various problems of retrieval and understanding. Secondly, the web represents a powerful means for the exchange of knowledge for business purposes, but this raises the issue of codification or formalisation of knowledge. Other classic themes in ECOM, such as the management of *intellectual property rights* on the Net or the establishment of trust for electronic markets, can be seen in relation to their implications for knowledge and KM. Furthermore, the potential of ECOM to transform value chains into *virtual value chains* implies that the flow of knowledge of products and traders can be handled independently of the physical flow of goods. The building of such virtual chains largely relies on new forms of knowledge-intensive intermediaries (e.g.: research services on the web, electronic malls, electronic auctions, web portals, etc.) whose role is to provide an appropriate environment that makes the retrieval and exchange of knowledge really possible.

This potentially fruitful relation between ECOM and KM requires more thorough analysis. The two fields of study have developed from different starting points and it is only in recent years that their convergence has been explored. More specifically, there is the need to move from the generic recognition of this relation to the definition of theoretical and practical *models* that can be of use to both scholars and decision makers. Furthermore, this analysis should be supported by fresh empirical investigations.

Indeed, the issue can be explored with different aims and approaches. A first approach, that we can call '*from KM to ECOM*', is based on the consideration that ECOM technologies can be regarded as key enablers of KM initiatives [19]. This suggests a first important question, namely: *under what conditions organisations can actually perform KM activities by means of ECOM.*

The previous question is strictly connected with the fact that neither KM nor ECOM can be simply resolved as a technical issue. As a matter of fact, having a sophisticated information and communication technology infrastructure does not exhaust all the KM activities [6,23,27,28]. The improved ability to process or transmit data across time and space does not necessarily lead to better communication and actions. Paradoxically, as the access to information on the web dramatically expands, the importance of the cognitive (human) skills to understand and exploit such information is greater and greater [15,29].

Even if the practice of KM emphasises technology-based initiatives [30], limiting KM only to technological aspects may be a mistake [4,31,32]. Indeed, a reflection on the passage from data to information and from information to knowledge (and vice versa) is extremely useful. Knowledge differs from information as much as information management differs from knowledge management [5,33]. ECOM systems themselves simply elaborate, store, and transmit data, and the technology itself is not able yet to reproduce human cognitive skills. Hence, the role played by human and social factors in the production and use of knowledge is still essential [34]. Furthermore, KM is a very complex and articulated activity entailing several sub-processes [35], involving different social contexts (from individuals, to groups and organisations), and depending on the strategy, structure, and 'culture' of an organisation [30]. This is the reason why the idea that any ECOM system is able to support any *KM process* is not practicable.

Therefore, if we take for granted that technology is not enough, this leads us to wonder *when* technology can be used and *for what*. The application of KM models thus becomes a powerful perspective to see when specific ECOM applications can be employed, to explain when ECOM fails or succeeds in supporting KM, as well as to know more about the benefits and limitations of ECOM when applied to support knowledge management initiatives [36].

In view of that, the first and initial aim of this special issue is to give a further contribution to the assessment of ECOM as a key component of KM systems. Indeed, this is an emerging topic in recent literature. For instance, there are various contributions [23,30,6,28,37,38] investigating the possible use of ECOM in distinct KM contexts, as well as its limits. Much of this early analysis focuses on the distinction between forms of knowledge and on the fact that ECOM, by nature, directly handles knowledge that can be translated into data. This is clearly a crucial point but not the only one. The literature of KM is developing various other issues (i.e. the application models, the processes, the roles, the value of KM), and there is the need for further insights into the way such articulated KM models can actually be of use in exploiting ECOM systems as KM enablers.

A second, different approach, that we can call '*from ECOM to KM*', is to assume that ECOM is, *by its nature*, a KM process. This is an innovative way of thinking with respect to the more traditional perspective, based on an information management view that links ECOM to the amount and efficiency of the information handled. Some authors [26] explicitly propose definitions where ECOM is seen as a part of an organisation's approach to KM. Others [39] see KM and ECOM as 'converging initiatives' towards a 'knowledge-based commerce'. According to this view, the value of ECOM should be seen in relation to the effectiveness of the KM processes underpinned [20]. This approach may also suggest guidelines for the implementation of ECOM, since a better and more accurate understanding of the KM processes occurring within an organisation can contribute to a more effective ECOM strategy [5]. This, therefore, suggests and addresses important questions such as *if and how organisations can effectively design ECOM applications using KM-derived guidelines*.

### 3 The collected papers: a guide

Although both the approaches presented above stress the potentially fruitful convergence between the two fields of study (KM and ECOM), we think that the distinction is useful

to make an attempt to classify the papers that contribute to the Special Issue. As a matter of fact, a first group of papers mainly comes from a KM perspective and investigates the potential role of ECOM technologies in supporting organisational KM. A second group of papers better covers the second approach, i.e. they assume (more or less explicitly) that the ultimate purpose of ECOM is to handle knowledge, and use KM concepts and methods to analyse the effective conditions for the success of an ECOM system thus they derive practical guidelines to design, implement, manage and evaluate ECOM projects. The final paper is included in a category apart, because it represents a concrete analysis of the present state of application of the concepts of KM and ECOM in real organisations.

### 3.1 *'From KM to ECOM'*

In this group of papers, the first and the fourth one debate the ways ECOM applications may assist effective knowledge sharing, and stress the importance of non-technical factors such as social context and trust. The second and the third analyse the potential impact of ECOM on the KM strategies practiced by an organisation.

In 'Understanding the dimensions of knowledge sharing: designing an intranet to improve operational performance in a multinational corporation' Tony Holden describes and discusses the ways a large multinational company, BP, deals with KM to deliver an intranet between independent parts of the global organisation, with the aim of improving operational performance through enhanced sharing of best practice knowledge. The basic assumption of the analysis is that the introduction of the system does not automatically lead to immediate business benefits. On the contrary, the operational and social issues have to be clearly understood before there is any attempt to implement the electronic communication infrastructure. This statement is verified by the author through the accurate description of three projects activated at BP, and the examination of their advantages and difficulties for operational knowledge-sharing. The main lesson from the examples examined is that their practicability is affected by social and cultural more than technical factors. In particular, the feasibility of a knowledge transfer process is probably due primarily to: development of a shared mental model; assurance that employee time spent in interacting was valued by the organisations; freedom to implement the details in accordance with the specific needs and operating procedures of each group or plant. The author also identifies three types of knowledge sharing networks (Interest, Practice and Commitment) each one with its own purpose and mechanisms. Accordingly, the author suggests possible guidelines for implementing these different networks and the managerial mechanisms that would make them work. In doing so, he distinguishes between technology, social and operational factors.

In 'Knowledge sharing in online communities and its relevance to knowledge management in the e-business era', Christopher Lueg analyses the impact of two intertwined trends that have emerged during the past few years: the increasing number of business-to-customer relationships, that requires customers to be online savvy; and the various alternative channels for information dissemination that the internet enables, where information can be published by bypassing traditional media control. For these reasons, online communities (i.e. social groupings where knowledge can be easily shared and where the social rules of this exchange are established) can play an important role in disseminating information and knowledge on the web. The paper illustrates some key aspects of the potential of online communities and describes the mechanisms of

information dissemination and knowledge sharing in specific cases (the virtual fast food and the virtual body art community). More specifically, the author investigates the scope and relevance of these activities to business, concluding that firms should not underestimate the 'soft power' of online communities. Monitoring 'what's on the Net' may be, in all respects, considered an important (and new) KM activity.

The paper 'Market strategies and business models for internet-based management education – implications for knowledge management' by Albrecht Enders and Thomas Hutzschenreuter, deals with the possible application of the internet and ECOM in a specific knowledge-intensive service, i.e. management education. After having discussed the advantages and limitations of traditional formats for providing management education programs, the authors debate the general characteristics of new internet-based formats and their specific advantages and shortcomings. Internet-based education may allow higher spatial and temporal flexibility, possible integration of various information and communication tools, the opportunity to learn at different paces and a continuous 'virtual' interaction between students and professor. However, the major limitations are the lack of all the social aspects which characterise the 'residential' format. The authors also underline the fact that the possible usage of the internet varies according to the different learning requirements involved, and that various possible business models for offering internet-based programs can be singled out. To sum up, ECOM can change a particular knowledge-intensive business model such as education but without leading to a unique strategy and implementation.

In 'Trust and electronic knowledge transfer', Joanne Roberts intends to advance the understanding of the inter-organisational transfer of knowledge through ECOM by analysing the role played by trust. Trust, a classical issue in ECOM studies, is here also recognised as an important factor for reducing the risks and uncertainties in the exchange of knowledge, and especially in the case of 'virtual' interconnections between parties. In particular, the paper discusses two aspects of such 'electronic-related' trust: the extent to which information and communication technologies can engender trust through the pure technical mechanisms of knowledge transfer; and whether and how technologies can help the formation of interpersonal trust, a prerequisite for the successful transfer of certain forms of knowledge. A tentative model of trust mechanisms in knowledge transfer is also proposed, and used to interpret the role of electronic vs. traditional KM processes. The author identifies two distinct types of trust in relation to the *kind* of knowledge developed and transferred: *hard trust* (resting on abstract systems or institutions that facilitate the validation and protection of knowledge), and *soft trust* (relying on social and cultural structures and interpersonal relations). While hard trust plays a significant role in electronic knowledge transfer (since ECOM technologies substantially deal with codified knowledge), the importance of soft trust is associated with the unavoidable presence of the tacit component in any ECOM exchange.

### 3.2 'From ECOM to KM'

The paper 'The role of trust in e-business knowledge management', by Judy Scott, deals with a similar issue compared to the previous paper but moves from the direct analysis of the role played by trust in business-to-business and business-to-consumer ECOM. Stressing the fact that ECOM allows the extension of KM beyond the organisational boundaries, the author underlines that trust can be a major obstacle to a widespread use of ECOM. In effect, without trust, consumers oppose internet shopping and companies

resist working 'electronically' together. Accordingly, the paper tries to empirically verify the applicability of a theoretical model of inter-organisational trust which is used to describe the relationships between different kinds of trust (rational cognitive-based trust, and social affective-based trust), of knowledge (tacit vs. explicit) and of information systems. The model is used to describe and evaluate specific contexts of the application of ECOM, such as COVISINT (the popular ECOM marketplace for the suppliers of the automotive industry) and the ECOM initiatives in retailing (e-tailers). The analysis highlights the different methods employed by carmakers and retailers to build cognitive and affective trust among their counterparts. Furthermore, empirical findings confirm that an emphasis on trust may be a key factor influencing the success of the initiatives described.

In 'The usability of websites for knowledge acquisition: a taxonomy of influences,' Xiang Fang and Clyde Holsapple develop a model to analyse and evaluate the factors which can affect the usefulness of a website. The starting point is that ECOM can, by its very nature, be regarded as a technological manifestation of KM. Consequently, a key question is how to design and deploy effective ECOM applications that are more usable in terms of KM. Although design guidelines have already been proposed in the literature, there has so far been little systematic and formal research into the issue. The problem is treated with reference to the development of a website for enabling or facilitating the acquisition of knowledge. The paper proposes a taxonomy of the main elements influencing the usability of a website for knowledge acquisition (i.e. the nature of the performed task, the characteristics of the end users, the features of the sponsor, the systems technical characteristics and the environmental constraints). This taxonomy is proposed both for defining useful guidelines for website developers and for identifying issues that have yet to be resolved (for instance, how a particular feature – e.g. the navigation structure – can affect the website's performance).

Strictly connected with the previous one, the paper 'Identifying and capturing knowledge for website usage: a platform for progress', by John Biggam, develops an analytical framework to design, realise and use a company website. Up to now, since the creation of a website is relatively undemanding, there has been an ill-considered rush to embrace ECOM by firms, often with unpredictable and embarrassing consequences, i.e. inadequate security, unexpected crashes, poor information quality, incorrect customer and product details and so on. To avoid such mistakes, companies must be able to capture the knowledge that should form a 'corporate knowledge portal', and to overcome the internal barriers that may hinder this collection of knowledge. The author contributes to the improvement of website design practices by developing a Knowledge Dichotomy Matrix, for recognising the different types of knowledge that constitute the web portals and for directing the resources to capturing these different knowledge types. As for the barriers to knowledge collection, the author underlines the employees' resistance to sharing knowledge (for instance, a perceived loss of power may lead to knowledge hoarding rather than knowledge sharing). The author finally addresses the question of the language used, stressing that a common language may not always favour the extraction of knowledge, especially when specific concepts and information are involved.

In 'Managing knowledge through electronic commerce applications: a framework for integrating information coming from heterogeneous web sources', Ilario Benetti *et al.* investigate the implementation issues arising from the interplay between ECOM, knowledge and KM. With this purpose, the paper examines the logic and the working

mechanisms of MOMIS, a semi-automatic system that can be used for creating virtual catalogues and other ECOM applications implying difficult issues of integration of information from heterogeneous sources. The analysis is useful to highlight the KM issues involved in the technical design of a software tool, and confirms that ECOM and KM are related issues that can (and should) be integrated. More specifically, a better and more accurate understanding of the KM processes underpinned can be essential to design and realise more effective ECOM applications.

The paper 'A knowledge management reading of electronic commerce: experience in the Italian clothing industry', by Gianluca Marchi *et al.*, aims to explore the application of a knowledge-based approach for the practical understanding of the potential and limitations of ECOM in a specific context of application, the Italian clothing industry. After discussing the main elements that should or may characterise a knowledge-based view of ECOM, the authors illustrate the experience of ECOM, both in the industry in general and with reference to a specific case study (the Italian clothing firm 'Basic Net'). The approach proposed proves to be useful in explaining the reasons for the success or failure of specific implementations of ECOM in accordance with the context of its application.

### 3.3 *The link between KM and ECOM: indications from 'the playground'*

As mentioned, the paper 'Knowledge connections as a pointer for models in e-business: some evidence from Australia', by Bill Martin and Hossein S. Zadah, is in a category apart. It investigates the diffusion of explicit KM practices and ECOM in Australia, based on a web-based questionnaire survey e-mailed to Human Resources specialists of 2,000 companies. In detail, the authors intend to verify whether and how organisations use concepts directly linked to KM and if managers perceive a direct relationship between KM and ECOM. The preliminary findings of the study show that, even in an industrialised country such as Australia, the explicit use of technologies, practices and techniques of both KM and ECOM is still scarce. It may be said that, even though companies seem to perceive the relevance of knowledge in business and are aware of the potential of ECOM, there is much to do (both at a conceptual and practical level) to define and disseminate tools that allow the understanding and management of knowledge and enable the positive relationship between KM and ECOM.

## 4 **Conclusions and implications for further research**

It is clear that a single collection of papers is not enough to exhaust the argument, but we think that the contributions point out a number of reasons showing that it may be sensible and fruitful to see KM and ECOM as converging fields of management studies. What is also particularly important here is that the papers propose an attempt to move from a simply 'theoretical' level (i.e. the general discussion about concepts and perspectives) to a more 'operative' one (i.e. how to use such concepts and models in practical contexts). On the one hand, ECOM technologies can be considered key ingredients of KM, on the other hand KM concepts and models can be useful to understand, evaluate and implement ECOM.

For instance, a KM-based approach proves to be useful for identifying the possible reasons for the failure or success of specific ECOM projects that can't be explained in



other ways. The research in this field also emphasises the importance of a contextual analysis of KM in ECOM implementation. Taxonomies of knowledge, knowledge flows and KM processes prove to be useful to explain the different usability and effectiveness of distinct ECOM technologies in different practical contexts of application. This is also a starting point for the definition of somewhat new managerial guidelines, both for the design and the implementation of ECOM.

Clearly, since KM and ECOM are still emerging fields, the investigations of the interplay between them is at an embryonic state, and we think that there is still room for much research. The papers themselves highlight the current limitations of a KM-view of ECOM (and of an ECOM-based implementation of KM), and also suggest several fascinating stimuli for a possible future research agenda.

Firstly, there is the need to better clarify the theoretical foundations of the use of knowledge as a reference concept in managerial practice, not only for KM and ECOM distinctly, but also for the convergence of the two fields. Also, the models of KM proposed in the literature are still little used in practical contexts, and empirical studies of the (early) experience in this field is essential to establish KM as a new managerial discipline. Some aspects of KM that is relevant to ECOM (in particular, the management of inter-organisational flows of knowledge) still deserve more thorough analysis. Furthermore, a better explanation is required of the way the explicit management of knowledge (with or without ECOM) can contribute to the generation of economic value in business.

As this Special Issue also shows, the joint dissemination of both KM practices and ECOM technologies, and the exploitation of their potential, largely rests on the hard work and the critical minds of scholars and practitioners. In this way, KM and ECOM will probably lose their evocative power but will become an integral and natural part of management practice. To paraphrase Prusak [15], this is the better direction these fields could take in the future.

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### References and Notes

- 1 As is well known, there is still much debate about the proper definition of 'electronic commerce', and there are scholars that propose a distinction between electronic commerce, electronic business, internet-based business, etc. However, these distinctions appear to be somewhat ambiguous, in some cases superfluous and even misleading. All the mentioned terms tend to refer to the *set of technologies and activities to interconnect trading partners and support business processes online*. For the purpose of this Special Issue, we find it appropriate to use the term Electronic Commerce as synonymous with the others.
- 2 We do not intend to discuss here the concept of knowledge and its philosophic or psychological implications. In this paper we prefer to assume a *working* business-based definition: knowledge is regarded as the *indispensable ingredient to make business*

*decisions or take actions* [see 3–6], and is clearly distinguished from pure *information* or simple *data*.

- 3 Davenport, T.H. and Prusak, L. (1998) 'Working knowledge: how organizations manage what they know', *Harvard Business Review*, Boston, MA.
- 4 Tiwana, A. (2000), *The Knowledge Management Toolkit*, Prentice Hall, Upper Saddle River, NJ.
- 5 Malhotra, Y. (2000) 'Knowledge management for e-business performance: advancing information strategy to 'internet time', *Information Strategy, The Executive's Journal*, Vol. 16, No. 4, pp.5–16.
- 6 Roberts, J. (2000) 'From know-how to show-how? Questioning the role of information and communication technologies in knowledge transfer', *Technology Analysis & Strategic Management*, Vol. 12, No. 4, pp.429–443.
- 7 It is sufficient to remember here: a) the special issues appeared in: *Strategic Management Journal* [8], *Technology Analysis & Strategic Management* [9], *Journal of Management Information Systems* [10], *Decision Support Systems* [11], *IBM Systems Journal* [12], *Journal of Management Studies* [13]; b) the new journals recently edited: *Journal of Knowledge Management*; *Journal of Knowledge and Process Management*; *Journal of Knowledge Management Practice*; and c) the numerous books dealing with the management of knowledge (the Knowledge Management Bookstore currently contains 216 titles about KM and related topics; see: [www.kmresource.com/bookstore.htm](http://www.kmresource.com/bookstore.htm)).
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- 9 Jordan, J. (1997) 'Competing through knowledge: an introduction', *Technology Analysis & Strategic Management*, Vol. 9, pp.379–381.
- 10 Davenport, T.H. and Grover, V. (2001) 'Special issue: knowledge management', *Journal of Management Information Systems*, Vol. 18, No. 1, pp.3–4.
- 11 Holsapple, C.W. (2001) 'Knowledge management support of decision making', *Decision Support Systems*, Vol. 4, No. 3, pp.1–3.
- 12 Ritsko, J.J. and Birman, A. (2001) 'Preface', *IBM Systems Journal*, Vol. 40, No. 4, pp.812–813.
- 13 Swan, J. and Scarbrough, H. (2001) Editorial, 'Knowledge management: concepts and controversial', *Journal of Management Studies*, Vol. 38, No. 7, 913–921.
- 14 Prusak (see [15]), one of the best known and highly regarded KM scholars, locates the beginning of the knowledge management timeline to a conference held in Boston in early 1993. Among the antecedents of the KM discipline the most often referred to is the resource-based theory of the firm, originally proposed by Penrose [16] and successively resumed and expanded by others [17,18].
- 15 Prusak, L. (2001) 'Where did knowledge management come from?', *IBM Systems Journal*, Vol. 40, No. 4, pp.1002–1007.
- 16 Penrose, E. (1959) *The Theory of the Growth of the Firm*, Basil Blackwell, London.
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- 20 Faheji, L., Srivastava, R., Sharon, J.S. and Smith, D.E. (2001) 'Linking e-business and operating processes: the role of knowledge management', *IBM Systems Journal*, Vol. 40, No. 4, pp.889–907.

- 21 Shin, M., Holden, T. and Schmidt, R.A. (2001) 'From knowledge theory to management practice: towards an integrated approach', *Information Processing & Management*, Vol. 37, pp.335–355.
- 22 Nonaka, I. and Takeuchi, H. (1995) *The Knowledge-Creating Company*, Oxford University Press, Oxford.
- 23 Walsham, G. (2001) 'Knowledge management: the benefits and limitations of computer systems', *European Management Journal*, Vol. 19, No. 6, pp.599–608.
- 24 The internet appears to be particularly useful in exchanging information between organisations, because:
  - 1 it may lower temporal and physical barriers
  - 2 it may facilitate the access to (and the retrieval of) data
  - 3 it may help to locate the various relevant elements of information sharing processes.
- 25 Hendriks, P. (1999) 'Why share knowledge? The influence of ICT on the motivation for knowledge sharing', *Knowledge and Process Management*, Vol. 6, No. 9, pp.91–100.
- 26 Holsapple, C.W. and Singh, M. (2000) 'Electronic commerce: from a definitional taxonomy toward a knowledge-management view', *Journal of Organizational Computing and Electronic Commerce*, Vol. 10, No. 3, pp.149–170.
- 27 Walsham, [11], in particular, states that ICTs 'are not *the answer* to improved knowledge sharing within and between people and organisation' since 'they do not replicate or replace the deep tacit knowledge of human beings which lies at the heart of human thought and action'. See also [23,6,28].
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- 34 Thomas, J.C., Kellog, W.A. and Erickson, T. (2001) 'The knowledge puzzle: Human and social factors in knowledge management', *IBM Systems Journal*, Vol. 40, No. 4, pp.863–884.
- 35 The subdivision of the KM process into the four sub-processes of: knowledge generation, storage/retrieval, transfer and application, is widely accepted by KM scholars.
- 36 For instance, Bolisani and Scarso [37], and Marwick [28] have analysed the potential contribution given by some selected information technologies to the four knowledge conversion processes indicated by Nonaka [22].
- 37 Bolisani, E. and Scarso, E. (1999) 'Information technology management: a knowledge-based perspective', *Technovation*, Vol. 19, pp.209–217.
- 38 Beckett, A.J., Wainwright, C.E.R. and Bance, D. (2000) 'Knowledge management: strategy or software?', *Management Decision*, Vol. 38, No. 9, pp.601–606.
- 39 Kocharekar, R. (2001) 'K-commerce: knowledge-based commerce architecture with convergence of e-commerce and knowledge management', *Information Systems Management*, Spring, pp.30–35.