
Editorial

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Biographical notes: Elayne Coakes is a Senior Lecturer in Business Information Management at the University of Westminster. Her research interests are in the sociotechnical aspects of systems especially knowledge management. She is the Vice Chair of the British Computer Society's Sociotechnical Specialist Group and active in promoting this view of information systems. She has written and edited numerous books as well as journal articles, conference papers and book chapters. She is Editor of the *International Journal of Sociotechnology and Knowledge Development*. Her PhD thesis relates to a sociotechnical view of the insufficiencies of boundaries and stakeholders in the strategic planning of information systems.

Yanqing Duan is a PhD and is a Professor of Information Systems at The University of Bedfordshire Business School. Her principal research interest is how the emerging Information and Communication Technologies (ICT) can be effectively used in, and their impact on, supporting decision making, facilitating knowledge transfer and improving skills development. This research focus is reflected in the context of ICT-based knowledge management and transfer, use of intelligent systems in supporting organisational and individual decision making, Small to Medium Enterprises (SMEs) adoption of e-commerce/e-business and web-based training systems for SMEs. She has co-ordinated many European Commission funded research projects and published over 100 papers in journals, books and international conference proceedings.

Wafi Al-Karaghoul is a PhD and a Lecturer in Business Information Management and Quantitative Methods now at the University of Brunel's Business School. He Lectures in Information Technology and Quantitative Methods. His research interests include ways to improve the use of information technology systems in business looking at system failures and requirements engineering; additionally he is interested in project and operations management; and developing an understanding of TQM and benchmarking applied to system development. He has published numerous refereed papers in journals, books and international conferences. Previously, he was employed in Database consultancy and Linear Programming in a Blue-chip Company.

A sociotechnical approach has proven to be a good guide for organisations, consultants, practitioners and theorists to investigate and support knowledge development, sharing and management activities. This is because it considers the major challenges facing organisations in a highly competitive and knowledge-intensive economy: joint optimisation; autonomous working; appropriate organisation structure; culture; group task support; self-determination and human resources management, including reward systems and authority structures. The focus of this Special Issue is to extend understanding of how, and whether, web-based technology in particular, is suitable for supporting innovation and knowledge sharing in SMEs at inter and intraorganisational levels, whilst taking a sociotechnical perspective of this area.

Corporate entrepreneurship may be defined as the promotion of innovation in an uncertain environment, and innovation as the process that through its products, service and processes, adds value and novelty to the organisation, its suppliers and customers. Research suggests that more than 85% of new product ideas never make it to market, and of those that do, 50 to 70% fail. Enablers highlighted in the general innovation literature typically include strategy, infrastructure, processes and supportive management culture. Thus, it would seem sociotechnical perspectives can assist innovation, as could a suitable infrastructure. SMEs are in an especially difficult position for innovation as their resources are more limited than larger enterprises and thus they might need greater support in their entrepreneurial activities. 'Market fit' requires innovation in product, service, supply or process. ICT can provide support for this innovation in multiple ways: for example, it can provide the e-market outlet; it can support the service/product supply chain and associated processes; and it can assist in innovation development.

What we saw in our papers was varied. The concept of a supportive culture was clearly highlighted in the paper of Philpott – firms that had a proactive culture and proactive management participated more widely and thus benefited more intensely.

Li in his paper says that firms that are motivated to learn from others' experience with a view to developing new skills, picking up new ideas and growing revenue develop into dynamic and innovative companies with the capability of learning new knowledge and skills through social interactions in networks.

There is also evidence he claims, that most small firms develop specific absorptive capacities by making use of resources drawn from outside. Firms know very well, the boundary of their capabilities and competencies, and are prepared to commit themselves to networking and alliance activities. This paper's research showed that collective

learning is most likely to happen in areas of new technology applications, change management, alternative strategies and different management approaches. Therefore, in the networked business environment, evidence showed that an ability to work closely with partners has become a well-recognised competency.

In Philpott's paper we hear about an innovation survey tool that was designed to provide an initial step to encourage companies in the region to consider communicating with their local universities. This tool thus starts to answer the problem around how to sustain innovation in SMEs. The tool provided the participating universities with an understanding of a client company's innovation profile thereby allowing knowledge management in terms of packaging existing know-how. From this starting point, it was possible for universities to engage knowledgeably with the client company, to capture specific business needs and to offer appropriate responses.

The experience in the East of England that they report, has been that voluntary engagement by businesses with the innovation tool is producing a valuable data set of information about the regional SME community, from skills needs to specific innovation opportunities. Being able to measure a need is enabling the universities and the regional advisory agencies to better plan their provision of services for SMEs.

Outcomes have been measured in terms of recognised knowledge transfer activities; however, a number of supplementary activities have also been recognised for example, SMEs joining virtual networks, SMEs engaging with course validation and 'in-kind' involvement in research projects where no payment exchanges hands. In terms of outcomes, the knowledge created and subsequent knowledge transfer activities undertaken stems mainly from the Internalisation and Socialisation stages at SMEs and universities. This is an important finding, in that it informs the next level of systems integration opportunities, for example, integrating SME internal knowledge management systems with those of the universities may well yield greater operational efficiencies, knowledge creation and subsequent knowledge transfer activities.

In their paper, and using sociotechnical approaches, Mason, Castleman and Parker examine the factors influencing the channel use for knowledge sharing in regional SME networks. Six sociotechnical criteria, such as: link strength; trustworthiness; tacitness; usability; durability and currency, are used to evaluate the major channels (face-to-face, e-mail, website, online forum and expert database) with two regional SME business networks. It is interesting to note that their empirical evidence show that none of the web-based channels were strong against all sociotechnical factors. They argue that regional development must begin with pro-active strategies that stimulate SMEs' knowledge-sharing using traditional face-to-face channels. It is only then that SMEs might be encouraged to use web-based communications. They urge SMEs to use an appropriate mix of channels to facilitate knowledge sharing.

Ala-Rämi and Inkinen look at the ways that social networking and use of ICT contribute to software product development. They address an important issue in looking at to what extent the use of ICT enhances the performance of innovation networks. Their study is based on a survey with small and medium sized software companies in North Finland. The authors stress that the choice of the surveyed region is interesting because it is a peripheral region, yet one which is one of the most successful regions in high technology in Europe. Ala-Rämi and Inkinen argue that ICTs can play an important role in innovation and collaboration networks of SMEs, but ICT has not eliminated the need for social interactions through personal meetings and physical proximity still has

not lost its importance. Therefore, innovation process and product development in SMEs, they say, is a combination of social know-how, technical experience and individual creativeness.

The key findings from Ala-Rämi and Inkinen are in agreement with the evidence collected by Mason, Castleman and Parker. These findings strongly support the adoption of sociotechnical approaches in understanding the use of technology for innovation and knowledge sharing.

The paper by Oni and Papazafeiropoulou looks at the implementation of technological deterministic theories, in particular the diffusion of broadband in SMEs. They highlight that the Diffusion of Innovations (DOI) theory provides a useful view of the diffusion process of new technologies. They also highlight that the Social Construction of Technology (SCOT) model provides an avenue to examine such views. In their paper, they indicate that the view they have provided could be considered limited, as it mainly looks at the supply side of the diffusion process, hence the need for the ability to examine the various different sides that influence the diffusion of new technologies. In this paper, they show perception gaps among the social groups involved in the diffusion process of broadband. These gaps, they argue, might explain the slow take up of broadband by SMEs in the UK.

Their conclusion is that broadband has not necessarily changed the way the internet is used. On the issue of costs as well, funding is available but none of the SMEs interviewed have benefited from it. Drawing from one of the elements of SCOT, closure can only be achieved if the government and vendors educate the SMEs about the benefits of broadband. These findings greatly support the Sociotechnical approach of the innovation diffusion model.

Bashir, Nunes and Russell also consider the importance of knowledge management (KM) in SMEs. The paper is an in-depth treatment that is very closely related to the core subject area of our special edition. Knowledge management (they argue) is crucial in fostering and sustaining competitive innovation processes that create economic and social value through the generation, development and implementation of new ideas. They emphasise that organisations which have readily adopted and implemented KM are found to be the larger, well financed and better resourced ones. There are many success stories of KM in large organisations, but these have not been replicated in SMEs. This paper aimed to address this gap by reporting on a research project that focused on exploring how KM is linked to innovation processes in SMEs within the UK energy sector.

From the data collected and analysed, the key findings from the exploratory statistics of Bashir, Nunes and Russell illustrates that relationships between KM and the innovation components can be established. For example, they found that at a strategic level, the majority of SMEs do not have formal KM and Innovation strategies. Nonetheless, 50% of SMEs that do have a formal KM strategy also have a formal innovation strategy; the association between these two variables is statistically.

They also found that the majority of SMEs which have made improvements in Strategy; Structure and Operations, did not allocate resources to KM activities, whereas the majority of SMEs that have made improvements in Marketing and Management, allocate resources to KM activities. This is an interesting result that needs further exploration in the future.

Chen and Hatizikis were looking at a wider application and took an international perspective. Their research found that most of the firms in China emphasised the acquisition phase of knowledge management more and stressed integration and

creation less. This pattern could be due to the youth of these enterprises: they are still in the early learning stages compared to enterprises in the developed western world. This particular study focused on the impact of absorptive capacity and organisational culture on knowledge management processes in Chinese SMEs. For future research on SMEs in emerging economies, examination of the interplay of institutional and organisational factors with the various phases of knowledge management should be fruitful, they argue.

In fact the Farun case they describe, has confirmed that when the SME firms move into more competitive and more global markets, they will have to develop other value-added assets in order to sustain their competitiveness. However, this is a big challenge for Chinese SMEs. In addition, the role of government has changed in China since 1995. Government now often plays the role of venture capitalist and knowledge constant. Research institutions, including universities, have also been involved in developing firms' advantages. The interactions between these parties and the corporate governance structure for knowledge integration and dissemination should be considered in future studies of the more mature Chinese SMEs.

Some Chinese SMEs however, have been able to grow and achieve their current leading role because of their focus on the local market and on cost advantages over other global firms. However, when an industry gets more sophisticated and the market becomes more global, these companies can no longer sustain their competitiveness. These SMEs have to develop new ventures, markets and products.

Having considered the papers in our special edition, we can now suggest what research should be undertaken next.

Firstly, the insight provided in terms of the theory of knowledge creation generates further research questions in terms of where public funds should be targeted to promote SME-University interaction and where systems developers should be working to remove SME-university interface costs.

Secondly, competence building through the management of externalities poses new challenges for firms in terms of trust building and skills of collaboration that need to be explored. In addition, how do small business managers assess their level of personal competence in this regard? How do managers develop it further? What role do universities play? Can e-learning contribute to the competence building in SMEs?

Thirdly, we find that one key question is how can SMEs in China (and other developing nations) apply their current knowledge to obtain synergy in the new ventures. What is the mechanism needed to achieve successful integration? What types of leadership are required to sustain the competitiveness of these firms?

Finally, findings from a number of papers argue that ICT will not diminish or replace the role of face-to-face personal contact and traditional social networking approaches in innovation development and knowledge sharing in SMEs. More research should be carried out to understand the extent and significance of informal channels and personal contact in innovation development and knowledge sharing.

We would like thank the authors of these papers for their hard work and patience with us during the development of this special edition and now hope, that you, the reader, will find these papers as interesting as we do.