

KNOWLEDGE MANAGEMENT IN ROMANIAN ITC SMES

Sebastian Ion CEPTUREANU

PhD, Assistant Professor,
The Bucharest University of Economic Studies



E-mail: ceptureanu@yahoo.com

Abstract:

This paper investigates how SMEs use ICT in order to obtain competitive advantage. We developed a questionnaire to which 79 companies responded. The main result obtained refers to the fact that there are connections between the uses of ICT and competitive advantage. Majority of respondents consider ICT a key factor in company development and building competitive advantage on domestic or international markets. Also, there is remnant potential in SMEs strategy regarding ICT who is not used appropriately. The research highlights the main tools of ICT used by Romanian SMEs and because it identifies the need for a frame of reference coherent for SME to manage and use the tools of knowledge economy in the future.

Key words: Knowledge management, Small to medium-sized enterprises, Management

Introduction

The studies investigate the use of ICT in SMEs, with particular reference to the use of such technology to gain competitive advantage (Ceptureanu SI, 2015) are rather scarce in academic areas of investigation. Current literature highlights the importance of constructing an IS/IT strategy in conjunction with the overall plan of the business. Though early studies have concentrated on large organisations, more recent studies have begun to consider the situation in SMEs (Ceptureanu EG, Ceptureanu SI, 2014). The paper will analyse the results and discuss the main findings. The first part of the study concentrated on the traditional uses of ICT. The second highlighted instances where SMEs are taking advantage of those techniques regarded as leading edge. The paper reviews the current literature on the various methods regarding competitive use of ICT, then, through the use of questionnaires and interviews investigates whether SMEs are in fact able to use ICT to take advantage of the various tools, techniques, and methodologies or whether certain impediments apply to them as a group. The research identifies that although impediments do exist to prevent some SMEs formulating an IS/IT strategy, in some cases they may be able to utilise new applications to gain competitive advantage. However, as such use is not found to be widespread, SMEs would benefit from assistance in the development of new models, tools, techniques, and methodologies to make the best possible use of the opportunities provided by ICT.

Literature review

SMEs are generally not utilising ICT fully, so as to gain competitive advantage. In some cases they are lacking the resources, and skills to do so. This lack of skills applies in

both the technical and business areas, and makes the introduction of knowledge management to gain competitive advantage largely unworkable in SMEs. There are ways that SMEs can overcome these constraints and these issues are discussed later in this section. It was clear from previous research that the area of competitive use of ICT in SMEs needed more research. Large organisations do not have a monopoly on the use of information and knowledge (Ceptureanu SI, 2015). SMEs need to make operational, tactical, and strategic decisions and without accurate information they will struggle to undertake this role. In some instances knowledge is seen as the capacity to recognize what information would be useful for making decisions. This would allow organisations to utilise a knowledge base enabling managers to interpret information and use it in decision making (Watson, 2002). This has led many organisations to view the archiving of best practices for later reference by other employees as a sensible means towards the end of efficient problem solving. It is also hoped that effective knowledge management will prevent unnecessary resources being tied up undertaking inefficient search processes (Malhotra, 2000). Traditionally, data stored within company databases came from transactions and did not include knowledge that employees may have gained from working in the organisation (Simon, 2001, Ceptureanu SI et al, 2015a).

SMEs are certainly not excluded from knowledge management initiatives and when one considers the entrepreneurial input into these organizations they are in a good position to exploit this potential. Furthermore, knowledge management systems can be developed on universally available software at low cost to the organisation (Jessup and Valacich, 2003, Ceptureanu SI et al, 2015b). However, it is still often difficult to justify the development of knowledge management systems on cost-benefit grounds (Skyrme, 1998). Most barriers to the development of knowledge management systems are non-technical (Awad and Ghaziri, 2003). It is expected that in the next few years commerce based on knowledge will overtake that based on tangible products and SMEs must position themselves firmly in this marketplace. This may entail the setting up of a successful learning organisation underpinned by an effective, shared corporate knowledge base (Wilson, 1997).

ICT has also advanced, enabling systems to be linked together within and across organisations and national boundaries (Menzies, 1993). However, changes in technology with their impact on the numbers and skills of the workforce, pose a major challenge (Ceptureanu EG, 2015a), for most organisations and those responsible for the human resources of their organization (Bee and Bee, 1994). Small organizations may find it difficult to justify a substantial financial commitment in an area that they do not recognise as being a core element of their business. An outsourcing relationship may be financially prohibitive as well as having the organisation reliant on third parties (Mylott, 1995). It may be necessary to recruit an expert similar to a knowledge engineer who is used to building expert systems (Watson et al., 1997). Different authors have different perspectives on the scope of knowledge management. If one considers that it could include workflow, document control, e-mail, intranets, extranets, e-business, CRM, data mining and business intelligence (Regan and O'Connor, 2001), there is no reason why SMEs should be excluded on a technical or intellectual level.

A major constraint for small firms in the area of e-business and knowledge management may be their inability to make the necessary investment to take advantage of the new concepts and ICT (Ceptureanu SI, 2014). They may have to rely on outside consultants and significant knowledge transfer to make a viable contribution to their business. This is

very problematical as most small firms cannot afford to employ private consultants (Soriano et al., 2002). The current assistance offered to SMEs is fragmented, of variable quality, and in the case of certain providers, of suspect independence and motivation. Small companies even tend to rely on formal and informal networks rather than utilising publicly funded sources of support (Anderson and Boocock, 2002).

The question of whether these changes have affected ICT use in SMEs needs to be answered by first considering how SMEs use ICT (Ceptureanu EG, 2015b). The use of IT in SMEs has also seen significant changes. Poutsma and Walravens (1989) suggest that small firms used their computers as tools rather than communications media. Kagen et al. (1990) in their later survey of 884 small firms in the USA found that the majority of small businesses still used mostly word processing, payroll applications, and inventory packages. Since, then, however, the increasing availability of new IT and applications suggests that SMEs may have changed their use of ICT (Ceptureanu EG, 2015c). There may be economic reasons for this potential change. Pollard and Hayne (1998) highlighted this, and stated that in the last 15 years hardware costs have fallen dramatically, while processing power and storage capacity have grown.

There has also been an increase in the range of affordable, “off-the-shelf” packages, which has given small businesses the potential to take advantage of the opportunities offered by ICT. With the introduction of personal computers, file servers and networks, small firms have the potential to take advantage of the same technology that large business has access to (Pollard and Hayne, 1998). This suggests that the gap in usage between large and small firms has narrowed. This is further enhanced when one considers the possibilities that the use of communications technology can have for SMEs, i.e. electronic data interchange (EDI) could allow SMEs to link up with customers and suppliers.

Research methodology

The research method used consisted of mailed. Firms were selected on the basis of number of employees less than 250, so complying with the official definition. For the first part of the study a total of 121 questionnaires were despatched to Romanian SMEs. Of the respondents, 79 indicated that they would provide follow-up information. Confidentiality was maintained in the analysis of the data. A mixture of the sample used in the overall study provided a more randomised sample and thus minimized bias. A total of 121 questionnaires were sent to the IT managers, entrepreneurs or equivalent, and 79 responses were received. However, these achieved a response rate of 65,28%.

Results, analysis, and discussion

The following section gives an analysis of various areas covered by the questionnaire.

Table 1.

	Survey sample (N=79)
Micro	9
Small	43
Medium	27
Total	79

As can be seen from Table 2, networked PC's were the most popular choice for SMEs. However, this does not yet have the totality of a rule as there are clear exceptions where eight organisations still relied on a mainframe environment. As one would expect the only evident difference due to size was that small firms were more likely to have a single format of computer, and that none of the medium sized respondents had only standalone PC's.

Table 2.

PCs			Networked PCs			Mainframe		
Micro	Small	Medium	Micro	Small	Medium	Micro	Small	Medium
5	38	27	4	33	27	1	11	25

Table 3 shows the concept of using ICT to gain some form of competitive advantage. ICT's most useful role was seen as cost reduction. The use of ICT for the improvement of products or services was recognised by 36 companies and 26 of the respondents thought ICT could help market specialisation.

Table 3.

Cost			Specialize			Improve		
Micro	Small	Medium	Micro	Small	Medium	Micro	Small	Medium
7	38	22	2	11	12	3	13	19

In order to assess the feasibility of this approach, the ability of SMEs to produce a business plan of the requisite time horizon, considered necessary to underpin an IS/IT strategy by Silk (1991) and Hickey (1993), is examined. The analysis in Table 4 showed the length of time that these firms were currently planning ahead. Only 3 small firms stated they had no prepared business plans. A number of 16 firms had a 2-3 year plan with 24 adopting a 1-2 year plan. Ten organisations adopted a 4-5 year planning cycle. Only three respondents had plans extending over five years, one being a small firm.

Table 4.

1 year	1-2 years	2-3 years	4-5 years	5 years	None
21	24	16	10	8	3

To examine whether SMEs are utilizing their resources to gain competitive advantage the current use of ICT applications was assessed in Table 5. Only two small firms use RER, 3 Case Studies. As can be seen, a significant number of firms used Expert searcher techniques and knowledge collections technique.

Table 5

Social Network Analysis	Knowledge Matrix	"Expert searcher" technique	Knowledge Collection technique	White pages technique	Tranduser	K profile	Know-net technique	Cas e study	Rapid evidence review (RER)
11	8	16	16	2	9	6	6	3	2

Table 6 shows that the lack of time to take advantage of ICT was by far the most significant impediment cited by 57 of the respondents. The next most significant impediments were skills and trained staff shortage. It should be noted that small firms cited less impediments than the medium-sized firms.

Table 6.

Time			Skills			Staff			Hardware			Software			Services			Speed		
Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium	Mi-cro	Sm all	Me-dium
7	38	22	4	31	21	6	33	19	4	33	18	3	29	17	15	2	26	2	21	11

Owing to the nature of these high technology and highly e-business aware SMEs we further investigated the use of knowledge management in such enterprises. We envisaged that knowledge management is a relatively new concept for SMEs. Although it has been successfully applied in large enterprises, it would be interesting to find out whether the SMEs community accepts such recognition. Table 7 shows the use of knowledge management in SMEs. The results showed no difference between SMEs in the use of knowledge management. Some 86 per cent of these enterprises do not use knowledge management and further interviews with the respondents found that this is the core problem in the enterprises in that expertise's are lost and a method to retain the expertise is not available. During the interviews, we also found that these enterprises do not create knowledge from existing information and business processes, and hence if the expert is not available, and the same problem arises, no alternatives can be used to resolve the problem effectively. This finding showed that these enterprises are rigid, inflexible, non-agile and non-responsive to change and uncertainty in business and manufacturing environments.

Table 7.

Use of knowledge management	Do not use knowledge management
11	68

Discussion and conclusions

Though many writers such as Robson (1997) had developed the idea of using ICT competitively by forming an IS/IT strategy aligned with an underlying business plan, few if any of such writers had specifically considered the application of the idea to smaller firms. The research indicates that SMEs have relatively short-term planning horizons, so confirming Hall's (1995) view. The research concurs with the suggestion of Laverick et al. (1995) and Pollard and Hayne (1998) that lack of skills, training, and trained staff were indeed significant impediments. Comments expressed during the interviews also indicate that the remedy of getting extra training or recruiting staff is hampered by financial constraints so confirming Pritchard's (1998) view. The high response to this lack of skilled staff raises the possibility that SMEs do not have the business and technical skills Feeny and Willcocks (1998) consider necessary to fully exploit their ICT. These factors suggest that Henderson and Venkatraman's (1999) idea of "communities of expertise" within firms may still be difficult for SMEs. The results appear to directly contradict Poutsma and Walravens' (1989) view that communications applications were under-utilised by small firms. However, this may have occurred by

the technology becoming available to smaller firms through lower costs and more widespread knowledge, rather than as a direct initiative of the firms themselves. Some of the fundamental barriers have been removed. Despite the increasing availability of technology the other methods of using ICT competitively by developing the use of current applications are also poorly represented. The majority of such uses were taken advantage of by less than half the respondents, confirming the suggestion of Kagen et al. (1990) that applications were not being fully utilised, and as such, failing to fulfil what Boshyk (1999) considers a necessary use of ICT. However, the correlation between size of company and its competitive use of ICT appears more complex than a direct relationship. It appears that whilst medium-sized firms used ICT more competitively their impediments were, in some cases, also greater. SMEs generally are not utilising ICT fully, so as to gain competitive advantage, lacking the resources, and skills to do so. This lack of skills applies in both the technical and business areas, and makes the IS/IT strategy approach to gaining competitive advantage largely unworkable in SMEs, in its current format. Therefore, this result suggested that these SMEs require support in knowledge management to achieve the goal. This support may be in terms of education and training, and developing new tools and methods to acquire and manage knowledge in SMEs. In relation to knowledge management, we found that these SMEs tend to create tacit knowledge although a method to capture and acquire such knowledge has not been used. The tacit knowledge was derived from personal experience and wisdom, organically created and shared amongst individuals in the relevant department. The tacit knowledge created includes practical approaches in dealing with certain tardy supply of material, cutting tools substitution when a specific tool is not available and appropriate manner to deal with certain types of customer. We also found no evidence that a method to capture and acquire cultural knowledge has been used by these enterprises. This research found that SMEs are prone to use tacit and cultural knowledge due to the low level of complexity in acquiring, creating and managing such knowledge. In the manufacturing environment of high technology and highly e-business aware small enterprises, many work and processes can be dealt with quickly using a combination of authoritarian approach and ad hoc manner. Therefore, sharing of information and knowledge in such environment becomes easier and less complex. However, SMEs will have more difficulty in acquiring, creating and managing explicit

It is clear from the study and its review that the area of competitive use of ICT in SMEs needs more research; with the bulk of previous research applying to large companies and the general assumption that the same resultant ideas apply to smaller companies is not adequate. The trading of information is very topical, though few if any authors have assessed the influence that deliberate misinformation could have on the idea. This research does evidence the use of applications such as EDI being used as a competitive weapon, but by larger companies to force changes on smaller companies. The possible economic effects of such developments require further study. The applicability of other methodologies seeking to gain competitive advantage by aligning ICT with the aims of an SME needs to be explored.

References

1. Anderson, V. and Boocock, G. **Small firms and internationalisation: learning to manage and managing to learn**, Human Resource Management Journal, Vol. 12, No. 3, 2002, pp. 5-24.

2. Awad, E.M. and Ghaziri, H.M. **Knowledge Management**, Prentice-Hall, Englewood 3. Cliffs, NJ, 2003
3. Bee, F. and Bee, R. **Training Needs Analysis and Evaluation**, Institute of Personnel Management, London, 1994
4. Boshyk, Y. **Beyond knowledge management: how companies mobilise experience**, Financial Times, 8 February, 1999, pp. 12-13
5. Ceptureanu, S.I. **Knowledge Based Economy in Romania: Comparative Approach**, Journal of Applied Quantitative Methods, Vol. 9, No. 4, 2014, pp. 51-61
6. Ceptureanu, E.G. **Survey regarding resistance to change in Romanian innovative SMEs from IT Sector**, Journal of Applied Quantitative Methods, Vol. 10, No. 1, 2015, pp. 105-116
7. Ceptureanu, E.G. **Employee's reaction to change in Romanian SMEs**, Review of International Comparative Management, Vol. 16, No. 1, 2015, pp. 77-87
8. Ceptureanu, S.I. **Competitiveness of SMEs**, Business Excellence and Management Review, Vol. 5, No. 2, 2015, pp. 55-67
9. Ceptureanu, E.G. **Research Regarding change management tools on EU SMEs**, Business Excellence and Management Review, Vol. 5, No. 2, 2015, pp. 28-32
10. Ceptureanu, E.G. and Ceptureanu S.I. **Change management survey on innovative ITC Romanian SMEs**, Quality- Access to success, Vol. 16, No. 144, 2014, pp. 62-65
11. Ceptureanu, S.I. and Ceptureanu, E.G. **Knowledge management in Romanian companies**, Quality- Access to success, Vol. 16, No. 145, 2015a, pp. 61-66
12. Ceptureanu, S.I. and Ceptureanu, E.G. **Challenges and Barriers of European Young Entrepreneurs**, Management Research and Practice, Vol. 7, No. 3, 2015, pp. 34-58
13. Ceptureanu S.I. **Knowledge management in Romanian young SMEs**, Review of International Comparative Management, Vol. 16, No. 1, 2015, pp. 5-22
14. Feeny, D.F. and Willcocks, L.P. **Core IS capabilities for exploiting information technology**, Sloan Management Review, Spring, 1998, pp. 9-21
15. Mason, C. (Eds) **Small Firms: Entrepreneurship in the Nineties**, Paul Chapman, London
16. Hall, G. **Surviving and Prospering in the Small Firm Sector**, Routledge, London, 1995
17. Henderson, D.J. and Venkatraman, N. **Five principles for making the most of IT**, Financial Times, 1999
18. Jessup, L. and Valacich, J. **Information Systems Today**, Prentice-Hall, Englewood Cliffs, NJ, 2003
19. Kagen, P., Lau, K. and Nusgart, K. **Information systems usage within small business firms**, Entrepreneurship, Theory and Practice, Spring, 1990, pp. 25-37
20. Laverick, F., Littler, D., Bruce, M. and Wilson, D. **Information Technology and Business Planning**, Manchester School of Management, Manchester, 1995
21. Malhotra, Y. **From information management to knowledge management: beyond the hi-tech hidebound systems**, in Srikantaiah, T.K. and Koenig, M.E.D. (Eds), "Knowledge Management", Information Today, Medford, NJ, 2000 pp. 37-61

22. Menzies, R. **Information systems security**, in Peppard, J. (Ed.), "IT Strategy for Business", Pitman, Boston, MA, 1993
23. Mylott, T.R. **Computer Outsourcing: Managing the Transfer of IS**, Prentice-Hall, Englewood Cliffs, NJ, 1995
24. Pollard, C.E. and Hayne, S.C. **The changing face of information system issues in small firms**, International Small Business Journal, Vol. 63 No. 16, 1998, pp. 71-87
25. Poutsma, E. and Walravens, A. **Technology and Small Enterprises: Technology, Autonomy and Industria**, Delft University Press, Delft, 1989
26. Pritchard, S. **Network: IT for the SME**, The Independent, Item 104: Q1, 12 May, 1998
27. Regan, E.A. and O'Connor, B.N. **End-user Information Systems**, Prentice-Hall, Englewood Cliffs, NJ, 2001
28. Simon, J.C. **Introduction to Information Systems**, Wiley, New York, NY, 2001
29. Skyrme, D. **Measuring the Value of Knowledge**, Business Intelligence Limited, London, 1998
30. Soriano, D.R., Roig, S., Sanchis, J.R. and Torcal, R. **The role of consultants in SMEs**, International Small Business Journal, Vol. 20, No. 1, 2002, pp. 95-103