



# The Use of Hard and Soft Technologies for Knowledge Management in Small Businesses

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## INTRODUCTION

The business landscape has seen tremendous changes in the last decade and half. These changes include an increase in the number of market economies around the world, global production and consumption, enhanced individual and organizational technology sophistication and capability, the downward trend in technology usage costs, and use of the Internet and other computer networks for a range of business and personal activities. The source of competition is not the firm across the street but often it is global. Researchers have suggested that firm need to be agile (Mathiyalakan et. al. 2005) and that the classical view of production which encompasses land, labor, and capital need to modified to include knowledge which has become the predominant factor of production (Drucker, 2002). Knowledge is "the whole body of cognition's and skills which individuals use to solve problems. It includes both theories and practical, everyday rules and instructions for action. Knowledge is based on data and information, but unlike these, it is always bound to persons. It is constructed by individuals, and represents their beliefs about causal relationships" (Probst et. al. 1999). Simply put, knowledge management is concerned with "representing and processing knowledge. This includes knowledge handling by individuals, computers and all kinds of organization" (Holsapple and Whinston, 1996).

## PRIOR RESEARCH

Previous research has suggested that knowledge management systems provide several valuable benefits to a firm. The use of knowledge management systems can result in perceived process and organizational outcomes (Alavi 1999). Process outcomes include communication (enhanced communication, faster communication, more visible staff opinions, and increased staff participation), efficiency (reduced problem solving time, shortened proposal time, faster results, faster delivery to market, and greater overall efficiency). Potential organizational outcomes include financial (increased sales, decreased costs, and higher profitability), marketing (better service, customer focus, targeted marketing, and proactive marketing), and general (consistency, improved project management, and personnel reduction). However, there exist several barriers to knowledge management. The barriers include lack of resources, lack of user involvement, resistance by employees and organizational units, lack of authority and responsibility for implementation, insufficient management support, and a lack of the required IT (Gottschalk 2005). In addition to these, small businesses employees have poor incentive to contribute personal knowledge and due to resource limitation there is the difficulty in codifying tacit knowledge.

Stonehouse, Pemberton, and Barber (2001) examined the role of knowledge management systems within the airline industry. These systems were used to circumvent regulatory controls and maintain competitive advantage. The knowledge facilitators include recognition by the senior managers of the value of knowledge and how it can be used to influence competitive behavior, regular dissemination of information to all management levels, an appropriate organization structure to facilitate knowledge creation and sharing, an infrastructure for organizing and managing knowledge assets, integrated systems for knowledge

transfer, and a culture that fosters and empowers individuals and teams to develop and share knowledge. They also identified inhibitors which they define as factors that limit the abilities of competitors to create knowledge themselves. The inhibitors which an organization can erect include financial barriers which prevent or restrict access to information, timing of dissemination of useful information, information format which prevents or causes problems in transcription and/or interpretation, development of systems that are hard to replicate, knowledge retention through key organizational personnel, use of legal means to circumvent regulations, and devising knowledge dissemination and transfer procedures that slow down competitor ability's response.

There is a wealth of studies that are directed at examining issues related to knowledge management in large firms. But, knowledge management research within small business context is rare (McAdam & Reid, 2001; Beijerse, 2000). Research findings that use large businesses may not be applicable to small business as:

- Attewell and Rule (1991) suggested that previous research conclusions may not be valid for small businesses as most research was conducted using larger businesses and that organizational size is a key factor that affects organizational processes.
- Several researchers noted that management and organizational theories and practices that are applicable to larger firms may not be applicable to smaller firms (Blau et al. 1966, Blili and Raymond 1993).
- IT related small business research is often lacking (Roberts, 1998).
- Palvia and Palvia (1999) point "articles about 'truly' small businesses are rare in academic."
- The majority of studies dealing with technology implementation have been conducted at large organizations (Thong, 2001) and it is not clear whether these results can be extended to smaller firms.

Larger businesses have a greater access to capital (money, material, labor, and knowledge) and have greater freedom to engage in new technology adoption. The importance of availability of financial resources to IT success has been stressed by several researchers (Ein-Dor, Segev, Blumenthal, and Miller, 1984; Tait and Vessey, 1988). Financial resources are required for hardware and software purchases, employee training and development, site implementation and maintenance, and other services. Small businesses are susceptible to greater risk in IT implementation failure than their larger counterparts (Ein-Dor and Segev 1978) and if IT implementation is not successful, they face severe repercussions as they may not have the necessary organizational slack to act as a buffer (Carter, 1990).

## RESEARCH PROJECT

As small businesses suffer from resource poverty as noted above, the question arises as to whether small businesses need and can afford knowledge management or whether it is an unaffordable luxury. We argue that in today's networked global marketplace, knowledge manage-

ment is essential for both survival and for gaining competitive advantage. Knowledge management is not just about technology. Knowledge management consists of both soft elements (practices) and hard elements (technology). The use of hard elements, i.e. technology can enable an organization to become "better", i.e. more productive, efficient, effective, agile, and be superior to other firms in the marketplace. Examples of soft elements are training, job rotation, use of logs to maintain lessons learnt, mentoring etc. A possible strategy to alleviate resource constraints, small businesses can begin small by using appropriate soft elements and then use an evolutionary path to migrate to the use of hard elements.

Our goal in this study is to identify and catalogue both soft and hard elements that can contribute to success of knowledge management initiatives in a small business. We expect to use case studies and surveys of small business owners and managers located in Greater Boston and in rest of New England to identify knowledge management needs, perceived barriers and enablers, and the techniques both hard and soft that contribute to organizational success.

## REFERENCES

- Alavi, M. and D.E. Leidner. (1999). Knowledge Management Systems: Issues, Challenges, and Benefits. *Communications of the AIS*, 1(Article 7).
- Attewell, P. and Rule, J. (1991). Survey and other Methodologies Applied to IT Research: Experiences from a Comparative Study of Business Computing. *The Information Systems Research Challenge: Survey Research Methods*, K. Kraemer (Ed.), Harvard Business School Research Colloquium, Boston, MA.
- Beijerse, R.P. uit. (2000). Knowledge management in small and medium-sized companies: knowledge management for entrepreneurs. *Journal of Knowledge Management*, 4(2), 162-179.
- Blau, P.M., Heyderbrand, W.V. and R.W. Stauffer. (1966), "The Structure of Small Bureaucracies," *American Social Review*, 31(2), 179-191.
- Blili, S. and L. Raymond (1993), "Information Technology: Threats and Opportunities for Small and Medium sized Enterprises," *International Journal of Information Management*, 13 (6), 439-448.
- Carter, N.M. (1990), "Small firm adaptation: responses of physicians' organizations to regulatory and competitive uncertainty," *Academy of Management Journal*, 33 (2), 307-330.
- Ein-Dor, P. Segev, E., Blumenthal, D., and I. Miller. (1984). Perceived importance, investment, and success of MIS, or the MIS Zoo," *Systems Objectives Solutions*, 4, 61-67.
- Ein-Dor, P. and E. Segev. (1978), "Organizational Context and the Success of Management Information Systems," *Management Science*, 24(10), 1064-1077.
- Gottschalk, P. (2005). *Strategic Knowledge Management Technology*. Idea Group Publishing, Hershey, PA.
- Holsapple, C. and A.B. Whinston. (1996). *Decision Support Systems-A Knowledge-based Approach*. West Publishing, St. Paul, MN.
- Mathiyalakan, S., Ashrafi, N., Zhang, W., Waage, F., Kuilboer, J.P., and Heimann, D. (2005). Defining Business Agility: An Exploratory Study. *Proceedings of the 16<sup>th</sup> Information Resource Management Association International Conference*, San Diego, CA, May 15-18, pp. 848-849.
- McAdam, R. and R. Reid (2001). SME and large organization perceptions of knowledge management: comparisons and contrasts. *Journal of Knowledge Management*, 5(3), 231-241.
- Palvia, P.C. and S.C. Palvia. (1999), "An examination of the IT satisfaction of small- business users," *Information and Management*, 35, 127-137.
- Probst, G., Raub, S., Romhardt, K., and HA Doughty. (2000). *Managing Knowledge: Building Blocks for Success*. New York: John Wiley & Sons.
- Stonehouse, G.H., Pemberton, J.D., and C.E. Barber. (2001). The Role of Knowledge Facilitators and Inhibitors: Lessons from the Airline Reservation Systems. *Long Range Planning*, 34, 115-138.
- Tait, P. and I. Vessey. (1988), "The effect of user involvement on system success: a contingency approach," *MIS Quarterly*, 12(1), 91-108.
- Thong, J.Y.L. (2001), "Resource constraints and information systems implementation in Singaporean small businesses," *Omega: The International Journal of Management Science*, 29, 143-156.

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