

Knowledge Management: The Benefits and Limitations of Computer Systems

GEOFF WALSHAM, *Judge Institute of Management Studies, University of Cambridge*

Much organisational effort has been put into knowledge management initiatives in recent years, and information and communication technologies (ICTs) have been central to many of these initiatives. However, organisations have found that leveraging knowledge through ICTs is often hard to achieve. This paper addresses the question of why this is the case, and what we can learn of value to the future practice of knowledge management. The analysis in the paper is based on a human-centred view of knowledge, emphasising the deep tacit knowledge which underpins human thought and action, and the complex sense-reading and sense-giving processes which human beings carry out in communicating with each other and 'sharing' knowledge. The paper concludes that computer-based systems can be of benefit in knowledge-based activities, but only if we are careful in using such systems to support the development and communication of human meaning. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Knowledge management, Information and communication technologies, Tacit knowledge, Meaning, Communication, Knowledge-sharing

Introduction

Information and communication technologies (ICTs) have become an essential component of contemporary society, not least through the growth of the Internet. However, many issues concerned with the human aspects of the use of computer-based systems remain problematic despite technological advances. An enhanced ability to collect and process data, or to communicate electronically across time and space,

does not necessarily lead to improved human communication and action (Walsham, 2001). This article explores the issue of the benefits and limitations of computer systems in supporting human activity, with a specific focus on the topic of knowledge management.

Knowledge has been a fashionable subject in recent years, with significant attention focussed on areas such as the key role of knowledge workers, the need to generate and share knowledge, and the creation of knowledge-intensive organisations and societies. ICTs offer many potential opportunities in these domains. For example, the Web provides a wider set of data sources than any previous technology, with a massive range of information available for easy access. Electronic communication across time and space is faster and can carry much higher bandwidth than in previous eras. So, in principle, ICTs seem to offer human beings, and the organisations for which they work, much faster, cheaper and broader sources of data and means of communication to enable them to generate and share knowledge. It is not surprising that many organisations have invested significant amounts of time and money in knowledge management initiatives over the last few years.

However, the picture which is emerging is not a clear cut one in terms of the success of these initiatives. For example, McDermott (1999) noted that most companies soon find that leveraging knowledge through the use of ICTs is hard to achieve. Why is this the case? And what can we learn about the benefits and limitations of computer-based systems in this area which will be of value to improved future practice? The purpose of this article is to try to provide some answers to these questions, drawing on the significant amount of research and experience reported in

the academic and practitioner literatures. So, this is a stock-taking exercise to some extent, but I hope that the reader will find some interesting new insights from my attempt here at synthesis.

Knowledge and Knowledge-Sharing

I want to start with an obvious question, namely 'what is knowledge?'. Now this question has concerned philosophers for thousands of years, and it is unlikely that I can provide a new or definitive answer here. However, some reflections on the question are crucial in my view, not least in attempting to refute naïve and simplistic views of knowledge, some of which can be found alive and well in elements of the management literature. For example, I wish to argue against the simple view of knowledge as a commodity, or a quantifiable tradeable asset. I wish to take a more human-centred view of knowledge, with a strong focus on what is in people's minds, how they represent this to others, and how others interpret these representations.

A key figure in the literature on knowledge management in the 1990s was Ikujiro Nonaka (Nonaka, 1994). He popularised the distinction between 'tacit' and 'explicit' knowledge, and developed the well-known spiral of organisational knowledge creation drawing on conversions between these knowledge types. Nonaka drew heavily on the work of the philosopher Michael Polanyi in creating his knowledge management models, and whilst he himself seemed to have a good grasp of Polanyi's thinking, Nonaka's work is sometimes used to justify approaches which are not in the spirit of the original ideas. For example, Davenport *et al.* (1998) report some interesting empirical work on knowledge management projects, but perpetuate the view of knowledge as an object which can be transferred by highlighting the following:

To transfer tacit knowledge from individuals into a repository, organizations usually use some sort of community-based electronic discussion. (p. 45)

In order to see why this is not in keeping with Polanyi's ideas, and how the Chinese whispers through Nonaka and Davenport have distorted the original message, let us go back to what Polanyi himself had to say about the nature of knowledge and knowledge-sharing.

In discussing the way in which human beings perceive the world, Polanyi (1966) introduced the notion of tacit power as the way in which we actively shape or integrate new experience to discover and believe new knowledge:

However, I am looking at (perception of the world as a whole) ... the outcome of an active shaping of experience

performed in the pursuit of knowledge. This shaping or integrating I hold to be the great and indisputable tacit power by which all knowledge is discovered and, once discovered, is held to be true. (p. 6)

This tacit power produces the deep tacit knowledge which we have of the world in which we live, and this power is different for each individual due to our different initial dispositions and experiences. In commenting in a later work (Polanyi, 1969) on the nature of 'explicit knowledge', such as the contents of books for example or even the meaning of a single word, Polanyi is clear that there is no objective explicit knowledge independent of the individual's tacit knowing:

The ideal of a strictly explicit knowledge is indeed self-contradictory; deprived of their tacit coefficients, all spoken words, all formulae, all maps and graphs, are strictly meaningless. An exact mathematical theory means nothing unless we recognise an inexact non-mathematical knowledge on which it bears and a person whose judgement upholds this bearing. (p. 195)

What have these philosophical reflections to offer on the practical subject of the use of ICTs for knowledge management? I believe that they are highly relevant. All databases, on-line data sources, or the contents of e-mails are 'explicit knowledge', which should not be confused with the much deeper tacit knowledge which has created them in the first place. And will they be meaningful and helpful to others using them? Only if they connect well to the tacit knowledge of the user, and offer something new or interesting to this person. A manager of a multi-national company recently described his company's intranet to me as 'a large warehouse that nobody visits'. It seems that the 'explicit knowledge' contained on the intranet had not succeeded in connecting to the users' tacit world.

But before we look at why such occurrences are not uncommon, I want to go back to Polanyi one more time to see what he had to say about communication between people, since this is clearly what we are trying to achieve when we design our databases, send our e-mails or create our on-line sources. Firstly, he identified a distinction between attempts at sense-giving and sense-reading, both acts of tacit knowing:

Both the way we endow our own utterances with meaning and our attribution of meaning to the utterances of others are acts of tacit knowing. They represent *sense-giving* and *sense-reading* within the structure of tacit knowing. (Polanyi, 1969, p. 181)

Polanyi goes on to tell a story about these processes. He asks us to suppose that person A is travelling in a country which he has not visited before. By the end of the first morning, person A is full of new experiences and reports them by letter to a friend, person B. In Polanyi's view, this involves three 'integrations', or the blending of experience through tacit power as defined above. The first is an intelligent understanding of the sights and events (person A: sense-

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