

## Information highway

**Delving into information technology (IT) and knowledge management (KM) systems as part of some research into Hertfordshire Highways revealed the importance of quality management on the road to organizational awareness, says Patrick Walsh**

Frank Land was one of the team responsible for developing LEO, the first business computer, for the Lyons Company in the early 1950s. In 2001, Land stated that 'we are now in the age of a third revolution'. After the agrarian and industrial revolutions we are now in the age of the information revolution. As in all periods of great change, the initial stages are full of confusion and conflict. This particularly applies to the fields of IT and KM.

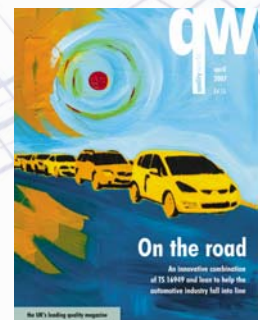
There has been a massive investment in IT systems over the last few decades, yet this has not managed to overturn the IT productivity paradox – that increased investment in IT does not equate to increased productivity. This was confirmed by a 2002 comparison of IT expenditure and financial performance in 7,500 US companies. The results showed that the top 25 performing companies spent just 0.8 per cent of their revenues on IT, while the average spend was 3.7 per cent.

In fact, IT initiatives have often been far from successful and, in some cases, at the centre of the most dramatic (and expensive) system failures. The Child Support Agency, London Ambulance and the Passport Office are examples of the organisations who have some experience of this.

KM was put on the map largely thanks to *The Knowledge Creating Company* by Ikujiro Nonaka and Hirotaka Takeuchi. This book gave an overview of the KM process and demonstrated, through case studies, how knowledge was successfully levered from employees in several large Japanese corporations. Put simply, KM is the formal process of engaging with staff at all levels and pro-actively extracting, codifying and disseminating their knowledge to boost innovation, processes and competitive advantage. Ultimately: 'Everyone has a good idea'.

### Fail safe?

IT projects often fail to take note of the wants and needs of users, the organizational culture and how people interact with the hardware or software system. IT personnel do not always find out what people really want from a system, getting caught up instead in the excitement of creating new functionality. The user, however, only sees the system as a means to an end and increased functionality often gets in the way of effective interaction with the system. While IT provides an indispensable infrastructure for managing information it should not dominate the process. Other skills are also required if a system is to be effective.



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KM initiatives have been subject to failures at the same magnitude as IT – in some cases as high as 70 per cent. Some believe this is because KM is often confused with IT. This has led to IT becoming dominant in the initiative and, due to the factors previously discussed, failing to deliver an effective system. A good example found in the research was that of a US navy KM initiative that failed due to too much IT and fashionable gadgetry that made the system unwieldy and hard to use. Users found it hard work and, after initially registering 1,000 users, two years later the average number of users of the system was around 30. In order to improve KM success rates it may be necessary to view IT as the junior partner in future initiatives.

KM remains a confused area with almost as many different definitions as there are practitioners. Yet KM, when effectively implemented, can deliver many benefits, especially when it comes to generating new ideas. Innovation is essential if a company hopes to maintain competitive advantage. An information system is needed to effectively store this knowledge and ultimately make it available. The aim of this project was to produce an information system model that would be effective, low risk and capable of implementation by organisations of all sizes.

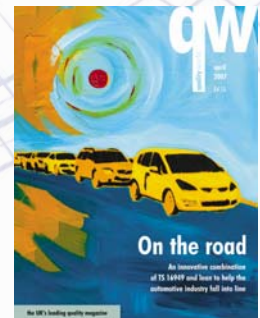
### Going manual

Information systems are important in creating the structure into which knowledge may be codified and disseminated. A good example of this process is the quality manual. Quality personnel obtain information from staff about a particular process by talking to them. They then write a procedure (codification) and publish the procedure in a manual (dissemination). Nowadays the manual is more likely to be accessed electronically rather than via a hard copy.

Information systems, like a good quality manual, must contain up-to-date information and data on all issues that can impact on the organization and its staff. And no organization exists in a vacuum. There are many external events that can impact on an organisation's competitiveness such as:

- legislation
- new technology
- new government or industry guidance
- new or updated standards
- customer requirements
- changes in the market

The research highlighted that a successful KM initiative did not need to be IT dependent. In one instance a company hired a librarian to act as their knowledge champion. The librarian used multiple sources of information (internet, industry journals, books, news items etc) and then reproduced the information in a form that best suited a particular user. Some users preferred detailed text, some liked graphical summaries such as trend and pie charts, while other users absorbed the information best by having the champion talk them through it.



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This human-orientated approach to information management paid dividends as staff were kept fully informed and didn't waste their time searching for information. If they could not find information quickly they passed the request on to the knowledge champion and got on with their work. Having this system in place meant they could react to new circumstances faster and more effectively than the competition.

### Levels of technology

The research consisted of two parts: a review of available literature and a staff survey. Hertfordshire Highways is responsible for the maintenance and improvement of all non-motorway roads in the county and as such is answerable to many stakeholders – government, elected councillors, road users, transport lobby groups, utilities and of course the public.

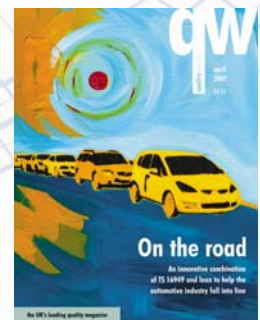
An effective information system is a necessity. In the survey a large sample of staff were asked specific questions related to the current information system to establish satisfaction levels. They were also asked general questions about their computer usage and perceptions of IT in general which provided an overall profile of the system's users.

The literature review identified that a low change, low-tech approach might yield the best results. 'Low change' can be achieved by slowly phasing in information and KM initiatives. Such an approach will:

- reduce perceived organizational change. Organizational change that is too radical can lead to an increased risk of failure
- ensure that key areas are prioritized so that immediate gains can be made
- demonstrate the benefits of a successful small project in key areas. This will help future projects to succeed
- reduce the risk of resource loss through failure
- enable costs to be spread over time

Low-tech approaches are also advisable in order to reduce risk. The level of technology required differs from organization to organization and mainly depends on two factors – size and information intensity. As organizations grow, so does the need for a formal information system. Where there are only two employees all instructions may be given in person. Where there are 2000 this becomes impossible. Work instructions must be documented and distributed to all staff and performance data collected.

Information intensity must also be considered. This information may be defined as 'the volume of information which an organization needs to generate or consume in order to maintain effectiveness'. It can be seen that the information needs of a small firm of contract packers, for example, will differ hugely to that of a small firm of stockbrokers.



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### The trouble with SMEs

Many observers have pointed out that small to medium sized enterprises (SMEs) have been marginalized with regards to KM. This may be due to the common misconception that only organisations with large IT budgets can afford KM. This may have arisen as many of the first KM initiatives were carried out in large corporations using expensive dedicated IT hardware and software. SMEs generally do not have the resources to compete with such organisations when it comes to high-tech investment. Yet, in some respects, small organisations could actually benefit more from KM. The loss of knowledge that occurs when key employees leave, for example, can seriously affect the competitiveness of small businesses.

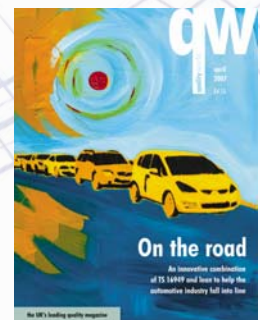
Again, the research identified the need for a knowledge champion, someone who will take overall responsibility for the information system and for the leveraging and dissemination of knowledge gained from employees. In larger organisations, employing a person to act as a dedicated knowledge champion makes sense. In SMEs, due to inherent financial constraints, it would probably be more appropriate to give the responsibility to an existing function.

To move an information system forward effectively, the survey identified that it was important to:

- assess the general level of computer literacy in the group so that the information system and the language used are pitched at the right level. If it is too complicated then the system will not be used and if it is too simplistic users may feel patronized assess the navigability of the information system using the internet as a benchmark. Information quality is irrelevant if users cannot easily access the information when they require it
- ensure that system content is relevant and timely
- ensure that users are periodically consulted to make sure the information system is still fulfilling its aims. For larger organisations, e-survey software is now available that takes a lot of the drudgery out of questionnaire surveys
- ensure that effectiveness criteria for the system are identified and are used throughout the life of the system. Criteria such as how often the system is used, the level of technical problems users encounter, internal audit information and questionnaire results may be considered

Respondents were also invited to make their own comments. One message that came through loud and clear was that many felt that the use of electronic media was replacing face-to-face contact and was de-humanizing the day-to-day work experience.

Indeed, most information is gained non-verbally. If electronic media is the only means of communication the non-verbal information will be lost, probably leading to an increased risk of misunderstandings – irony and jokes can easily be misinterpreted. Also the morale boosting effect of physical contact should not be underestimated. Having someone saying thank you for work well done by coming to your desk and shaking your hand may well be worth a thousand emails.



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## The role of quality?

Quality seems to have been largely overlooked in the rush to adopt IT and KM. Perhaps failures in IT and KM initiatives have led smaller organisations, with limited resources, to view such initiatives as a bad gamble. Quality has been in the business of leveraging knowledge from staff to produce policy documents, procedures and processes for decades yet KM is rarely linked with the quality function.

Smaller organisations that are less information intensive may need to hand the responsibility for information or KM initiatives to an existing function. Quality personnel may well be the best option. Quality has been involved in KM for many decades. According to the influential quality practitioner Armand Feigenbaum: 'the most underutilized resource of many companies is the knowledge and skill of employees. That this is so has made improved use of the potential of this resource a key company objective.' Quality has long been involved in producing procedures based on the knowledge and experience of staff. Nonaka's classification of types of knowledge has now become common currency and is quoted in much of the KM literature:

- tacit - knowledge that exists in someone's head
- explicit – knowledge that has been documented in some way, allowing others to share

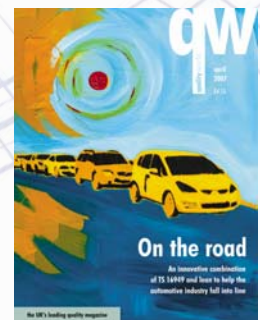
According to Nonaka and Hirotaka, knowledge may be transformed in four ways:

- tacit to tacit: people talking to each other or demonstrating how things are done (socialization)
- tacit to explicit: documenting tacit knowledge by writing it down or recording it in some other way (externalization)
- explicit to explicit: where explicit information is re-shaped e.g. a book into a film or the writing down of recorded voices (combination)
- explicit to tacit: when someone reads or views information and turns it into tacit knowledge, e.g. school, training courses, reading procedures (internalization)

In the *The Knowledge Creating Company*, Nonaka and Hirotaka admit that the creation of new knowledge 'boils down to the conversion of tacit to explicit knowledge'. The above categories can be mapped against the quality function of creating procedures.

Organizational culture can also represent a major barrier for information and KM initiatives. Early attempts to introduce quality have shown how resistant some organisations were in accepting change and new ideas. Organisations that have taken the quality message seriously have fought long and hard to achieve an effective quality culture.

Change has become part of the quality culture – accepting new methodologies such as total quality management, Six Sigma, just in time, lean manufacturing, quality function deployment etc. In organisations where the responsibility for KM is given to the quality function, the changes may be perceived as 'just another quality initiative' allowing KM to run in tandem with the organisation's quality culture. Even in larger



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organisations, assigning the knowledge champion to the quality function may aid a KM initiative's success.

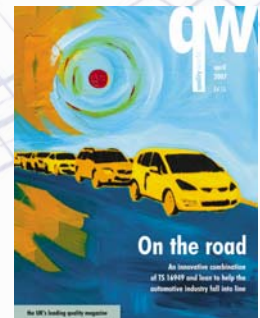
### **Forward thinking**

As knowledge becomes an ever more valuable commodity, organizations of all sizes will have to make arrangements for leveraging, storing and disseminating it if they are to remain competitive. Quality, in a limited way, has been doing this for decades.

In the future the quality of information and knowledge, how it is gathered and how it is made available will become crucial factors in maintaining competitive advantage. It may now be time for quality professionals to expand their vision of the role of quality for the future. They can create a new paradigm for the management of organizational information and knowledge – doing it the quality way.

Author bio - Patrick Walsh has been involved in the automotive quality sector for over 25 years. He is now integrated management systems manager for Hertfordshire Highways.

**JUNE 2006**



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