The role of organisational factors in combating tacit knowledge loss in organisations

E.C. Martins & N. Martins

A B S T R A C T

Knowledge loss poses a challenge to organisations that wish to remain competitive. The meaning of knowledge that exists in the minds of people and its manifestation in organisations is examined to provide a framework for the investigation of organisational human input factors and strategic risks of knowledge loss. A theoretical model was developed that identifies factors that would enhance knowledge retention, namely the identification of whose knowledge and what type of knowledge is at risk of loss; the manifestation of knowledge behaviours (learning, knowing, creating, sharing, transferring and applying knowledge); behavioural enhancers at the individual, group and organisational levels; and the identification of strategic risks of knowledge loss. Implementing a knowledge retention strategy taking these organisational factors into account would enhance knowledge retention.

Key words: knowledge loss, knowledge retention, knowledge behaviour, tacit knowing, theoretical model to combat knowledge loss

Introduction

The wave of knowledge loss and attrition that organisations are facing in a world of layoffs, retirements, staff turnover, mergers and acquisitions, and in a world that is currently in a recession, poses a threat and a challenge to organisations. Juliano (2004) stated that in the following five to ten years, the utility industry would face

Ms E.C. Martins is with Organisational Diagnostics cc; Prof. N. Martins is in the Department of Industrial and Organisational Psychology, University of South Africa. E-mail: martin@unisa.ac.za

its most severe workforce problem since World War II, namely a massive loss of job-specific and plant knowledge through the retirement of a large portion of the current utility workforce. Many consider the most significant business and societal trends for the next few decades to be the rapidly aging workforce (Foster 2005), more competitive recruiting and faster turnover among younger people (DeLong & Davenport 2003). Other factors that could bring about knowledge loss (as well as knowledge attrition and gaps) are rapid growth, mergers and acquisitions, internal redeployment (American Productivity and Quality Centre 2002), downsizing and retrenchments (Pickett 2004). The amount and type of knowledge that is generated in organisations combined with these trends could result in "massive quantities of invaluable, irreplaceable, specialised knowledge being lost by organisations every day" (DeLong 2004, in Salopek 2005; DeLong 2004, in Doyle 2004).

In a study conducted in the United States by TalentKeepers at 240 organisations, it was found that the greatest impact of employee turnover on organisations was lost knowledge (78%) as opposed to profitability (54%) (Frank, Finnegan & Taylor 2004). Kransdorff (2003) reports that the consequence of employee turnover with the most expensive price tag is the dispersal of an organisation's expensively acquired knowledge and experience. A result of this knowledge loss is that organisations are plagued with an inability to learn from past experience, which leads to reinvented wheels, unlearned lessons, a pattern of repeated mistakes, productivity shortfalls and a lack of continuous performance improvement. Hence it is important to ensure that knowledge is retained within the organisation (Bender & Fish 2000).

Importance of knowledge and knowledge loss challenges facing organisations

The knowledge and expertise of employees should be regarded as a critical strategic resource and a valuable asset in maintaining the competitive advantage of an organisation (Bender & Fish 2000; Wong & Radcliffe 2000). Stewart (1997, in Quintas 2002) points out that "knowledge has become the most important factor in economic life. It is the chief ingredient of what we buy and sell, the raw material with which we work. Intellectual capital – not natural resources, machinery, or even financial capital – has become the one indispensable asset of corporations". The importance of knowledge is emphasised by a European survey of 100 European business leaders, in which 89% considered "knowledge to be the key business power" (Murray & Myers 1997, in Quintas 2002).

The literature review revealed that there has been a focus on attracting, developing and retaining a knowledgeable workforce, on implementing IT applications/systems

to collect and store explicit knowledge, and on international research conducted on knowledge management models and measures, with some progress being made towards deriving knowledge management standards; however, there has been very little research in this area in South Africa (Tobin & Volavsek 2006: 96). There has not been much focus on the retention of knowledge that might be lost due to people leaving the organisation. It has been mentioned that when people leave, their knowledge leaves with them (Pickett 2004). Organisations need to find ways of retaining critical knowledge before people possessing this knowledge leave the organisation.

The challenges facing organisations are to identify the risks that could lead to knowledge loss and to become aware of factors that could impede or enhance knowledge retention in an attempt to combat the increasing knowledge loss and attrition that is affecting organisations. It is therefore important to understand *what type* of knowledge and *whose knowledge* might be at risk of loss to the organisation. Leaders in organisations need to understand and accommodate *front-line knowledge behaviours* (Pollard 2005) by managing the behavioural threats and enhancers in the context of the risk of knowledge loss and attempting to retain critical knowledge in the organisation. The loss of organisations' valuable knowledge would have a *strategic impact* on their business. It is therefore important to identify where lost knowledge could have an immediate threatening effect on the implementation of the organisation's strategy. This means that the organisation needs to determine in advance which knowledge, if lost, could undermine the organisational strategy (DeLong 2004).

Aim of article

The aim of this article is to determine what is understood by the concept of knowledge in organisations (in terms of its definition, appearance in organisations and the knowledge development process), what knowledge is at risk in organisations and should be retained, and whose knowledge should be retained. Behavioural and strategic risk factors that would influence knowledge retention will be examined. A model will be produced of the factors that should be considered in combating knowledge loss and retaining knowledge for successful strategy implementation so as to remain competitive and deliver the best service to the customers of the organisation.

Research design and methodology

The research design and methodology followed in this research was a theoretical approach to determine the factors that need to be considered in order to retain knowledge in organisations. A generic tool for academic work that contextualises

arguments, namely contextualized theory building (Venzin, Von Krogh & Roos 1998: 27) was deemed a useful tool to guide the investigation on the nature of knowledge. The contextualised theory-building process focuses on the epistemology, appearance and application of knowledge (Venzin et al. 1998: 27) and was used as a framework for exploring the nature of knowledge in organisations. The construct 'knowledge in organisations' was conceptualised, and the organisational and behavioural factors that might influence knowledge retention were determined. The theoretical model of organisational behaviour by Robbins (2005) was applied to the knowledge behaviours at individual, group and organisational levels. The outcome of this investigation is deemed to be the development of a theoretical model.

The concept of knowledge in organisations

Organisations should spend time determining what knowledge means in their organisations and how the concept should be applied in practice, because knowledge can mean different things to different people (Von Krogh, Ichijo & Nonaka 2000). A central challenge to managers is an understanding of the nature of knowledge and the different forms that knowledge can take (Venzin et al. 1998). The concept of knowledge in organisations is discussed in the rest of this section, elaborating on the appearance and development process of knowledge.

General definition of knowledge in organisations

Several definitions of knowledge found in the literature, by authors such as Bender and Fish (2000), Bennet and Bennet (2004), Chou and Tsai (2004), Davenport and Prusak (1998, in Choo 2003), Danskin, Englis, Solomon, Goldsmith and Dave (2005), McInerney (2002) and Nonaka, Toyama and Konno (2002), to name but a few, were analysed to gain a better understanding of the term. It appeared that the elements of the definitions could be categorised into four broad categories, namely origins of knowledge at individual, group and organisational levels; knowledge derived from information; mental state, and intellectual and social contingencies in creating knowledge; and use of or functions of knowledge.

From this analysis, it appears that 'knowledge' can be defined as follows: *knowledge originates at the individual, group and organisational levels; is derived from information; is interpreted and used by these three levels; is created through different human processes involving social, situational, cultural and institutional factors, making use of intellectual and social contingencies, which guide thought, communication and*

behaviours of people; and leads to definite actions. This definition establishes the basis for further investigation of what the concept of knowledge entails in organisations.

Appearance (manifestation) of knowledge in organisations

It is clear from the collation of the many definitions of knowledge that it is not an easy task to conceptualise and contextualise the term 'knowledge'. The manifestation of knowledge in organisations can be described by investigating different overall approaches that could be followed to categorise knowledge and the different forms that knowledge can take (Venzin et al. 1998).

Venzin et al. (1998) have clustered the categories of knowledge together in three different approaches to the nature of knowledge, namely object of knowledge development, process of knowledge development, and location of knowledge. The *object* of knowledge focuses on biotechnology, mathematics or linguistics (for example, procedural knowledge and knowledge of events and trends within and outside the organisation). The *process* of knowledge development focuses on either cognitive abilities or on the process of knowledge construction (creating, sharing, transferring and applying knowledge). The *location* of knowledge focuses on the carriers of knowledge, namely individuals, groups, organisations, inter-organisations and customers or industries. The location of knowledge also refers to *tacit knowledge* that explores the development and transfer of knowledge, embodied knowledge that requires experience from physical presence, and encoded knowledge that remains in the organisation after all employees have left (Venzin et al. 1998).

Venzin et al. (1998) claim that the list of categories in these three approaches to the nature of knowledge is not complete and mention strategic knowledge, also known as meta-knowledge, that represents higher-order categories. Strategic knowledge is knowledge about knowledge, for instance what type of knowledge it is, where it is located, how it is transferred, how it is stored and how swiftly it changes over time.

McInerney (2002) has a different approach to the appearance of knowledge and sees knowledge as "a collection of *processes* that allow learning to occur and knowing to be internalised". McInerney (2002) states that it is not easy to place knowledge within strict 'rungs' or on different taxonomic levels. It is not an object that can be 'placed', and it should not be confused with representations of knowledge as information in databases and documents.

The different approaches that can be followed to describe the appearance of knowledge, based on the preceding discussion, can be represented as shown in Figure 1.

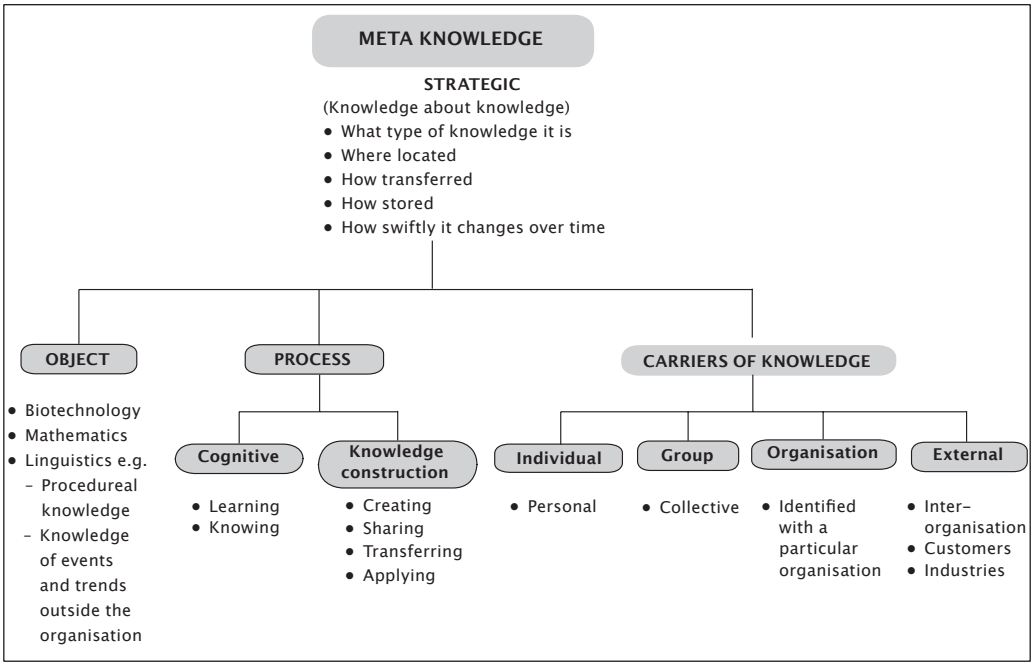

Figure 1: Overall approaches to the appearance (manifestation) of knowledge

This model might not be complete, as it is not easy to place knowledge in strict categories. However, the model does give a clearer indication of the many different aspects associated with the term 'knowledge', providing a platform from which to work in addressing the research issue. The critical knowledge in organisations that could be lost can be viewed from the two perspectives shown in Figure 1, namely knowledge development as a process and the carriers of knowledge. Knowledge manifests itself in the process of knowledge on a *cognitive* level through learning and knowing, and on a knowledge *construction* level through creating, sharing, transferring and applying knowledge. The *carriers of knowledge* refer to the people operating at the individual, group and organisational levels in organisations.

The knowledge development process

At the *cognitive* level, the integration of knowledge into knowing has embraced behavioural components in the study of knowledge. In embracing behavioural components, the concepts of knowledge, knowing and doing become more closely aligned with learning (Crossan & Hulland 2002). The authors of this article display this integration as shown in Figure 2, based on Crossan and Hulland's findings.

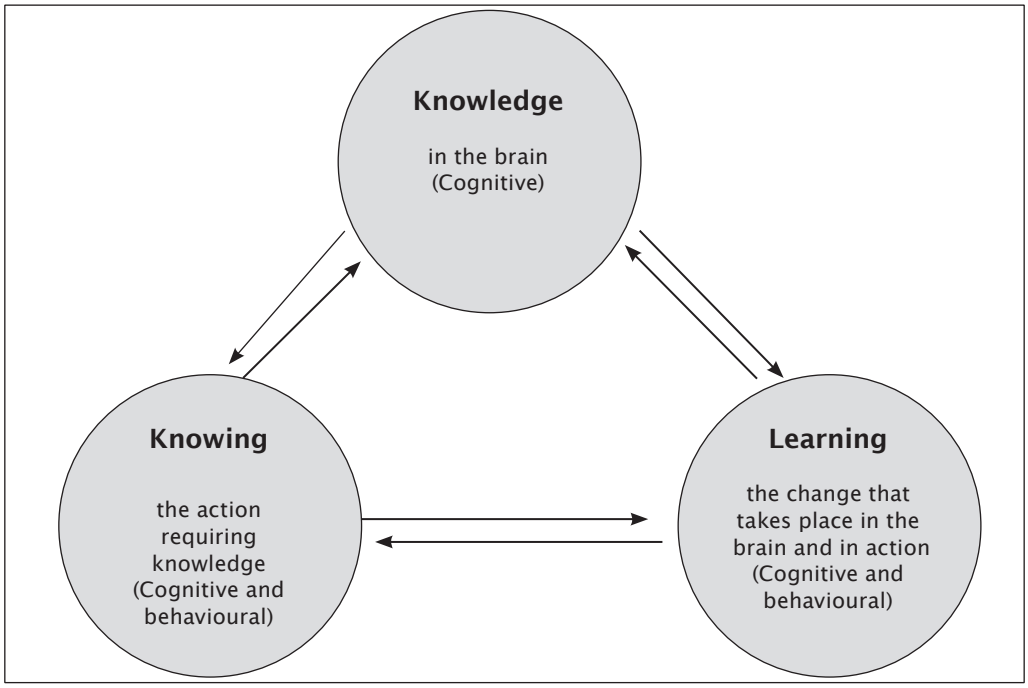

Figure 2: Integration of cognitive and behavioural processes of knowledge

Knowledge is thought to be the cognitive process (including human skills possessed); knowing is mainly behavioural (in other words, knowing in action); and organisational learning embraces both cognition and action (Vera & Crossan 2003; Crossan & Hulland 2002). Crossan and Hulland (2002) elaborate on the relationship between knowledge, knowing and learning. Knowledge is obtained through the mind (learning by reflection) and through the body (learning by doing). It is accumulated in the mind (know what – declarative knowledge) and in the body (know how – procedural knowledge). Knowing is practice or action (doing) that requires knowledge (at a cognitive level). Learning is the change that takes place in knowledge and in knowing, which in turn are the content of the learning process (in other words, what one learns or gets to know).

Learning behaviour manifests in organisations when employees continually learn to perform new and changing tasks in a specific context (Hall 1976, in Van der Sluis 2002) and when they learn how to learn efficiently. Learning occurs all the time and could be regarded as any relatively permanent change in behaviour that occurs as a result of experience. Change in behaviour indicates that learning has taken place (Robbins 2005). This means that changes on the behavioural side must be reconciled with changes on the cognitive side (in the form of cognitive maps, mental associations,

shared beliefs and understanding) (Salk & Simonin 2003). Learning behaviour could be meaning- or instruction-oriented, planned or emergent (Megginson 1996, in Van der Sluis 2002). *Knowing* (as an account of what a person knows) is mainly behaviour and manifests while putting knowledge into action (Vera & Crossan 2003) (for example, physically working on a project, or engaging in a task such as visiting a customer).

At the *construction level* of the knowledge development process, knowledge manifests in behaviours of employees working in an organisation. It is important to have an understanding of what actual knowledge behaviours entail as a background to the study of enhancing and impeding factors that would influence these behaviours. The *creation* of new knowledge manifests in behaviours such as attracting attention, eliciting discussion and building widespread consensus through dialogue and experience (Calhoun & Starbuck 2003). Knowledge *sharing* at a tacit level is bound to the senses, personal experience and bodily movement and requires close physical proximity with the work being done, through observation and narration (Von Krogh, Ichijo & Nonaka 2000), requiring a high level of socialisation (Nonaka 1995, in Ojha 2005). Knowledge *transfer* behaviour manifests in the transfer process of knowledge from the sender to the receiver (Szulanski & Cappetta 2003) in daily interactions with people (Tsai & Tsai 2005). *Applying* knowledge manifests in problem-solving, decision-making and task-execution behaviours (Alavi & Tiwana 2003). The knowledge construction processes are intertwined and affect one another in a continuous process that repeats itself time and again.

It could be argued that the manifestation of these cognitive and knowledge construction processes in certain behaviours could cause either tacit knowledge loss or the retention of tacit knowledge. It is therefore important to understand the enhancing or impeding factors that play a role in how these knowledge behaviours are manifested in organisations.

Behavioural factors that could cause knowledge loss

Gibson, Ivancevich and Donnelly (1994) define behaviour as "anything that a person does, such as talking, walking, thinking, or daydreaming. The action that results from an attitude". These definitions imply that behaviour refers to the way something is done (namely, action or manner). There seems to be a connection between behaviour and attitudes in the literature, based on the assumption that *attitudes* somehow influence behaviour (Cools & Van den Broeck 2006). An attitude can be defined as a "learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object" (Fishbein & Ajzen 1975, in Cools & Van den

Broeck 2006). Another definition is that attitudes are "beliefs and feelings people have about specific ideas, situations and people, which influence their behaviour" (Cools & Van den Broeck 2006). Both attitudes and resulting behaviours might play a role in causing knowledge loss.

The organisational behaviour model of Robbins (2005) was used to identify the behavioural factors that might influence the manifestation of knowledge behaviours in an organisation. His model portrays the independent variables at the individual, group and organisational levels. These variables were used as a guideline to search the literature for ways in which they would influence knowledge behaviours. The findings are summarised as follows:

- At the individual level, some factors that would influence knowledge retention are biographical differences such as those relating to gender, age, marital status, education level and job level (Ojha 2005; Peltokorpi 2006); values and attitudes towards retaining knowledge (such as willingness to share) (Bock, Zmud, Kim & Lee 2005; Mahee 2006); perceptions about others' willingness to display knowledge behaviours (Cabrera 2003, in Minbaeva & Michailova 2004); ability to communicate knowledge in an understandable way (Reagons & McEvily 2003, in Minbaeva & Michailova 2004); satisfaction, rewards and recognition received to motivate the practice of knowledge behaviours (Bock et al. 2005; Mahee 2006); taking responsibility for own learning; willingness for self-development; and actively engaging in learning opportunities (Bryson, Pajo, Ward & Mallon 2006).
- Knowledge retention enhancers at a group level pertain to factors such as effective communication between different cultures (Taylor & Osland 2003) and age groups (DeLong 2004); group structures that enable team members with similar fields of expertise to share their knowledge (Hayes & Walsham 2003); sensitivity to protection of work teams' special capabilities; acceptance of team goals (Child & Rodriques 2003); avoiding free-riding (Foss & Mahnke 2003); and cohesiveness (Robbins 2005). Other factors that would enhance knowledge retention at a group level include healthy interpersonal relationships and social interactions (Lin 2007); conflict resolution (Fang, Tsai & Chang 2005); leadership and trust in terms, for example, of managers acting as knowledge champions (Van der Sluis 2004); and the promotion of trusting relationships (DeLong 2004; Robbins 2005).
- At an organisational level, the culture, structure and human resources policies and practices influence knowledge behaviours. A culture that focuses on knowledge retention (DeLong 2004); values such as organisational trust, respect, openness, transparency, fairness and innovativeness (DeLong 2004; Devos & Willem 2006; Bock et al. 2005); and a structure that promotes interaction between members who share a concern, set of problems or passion about a topic and encourages

bridge-building between different functions would enhance knowledge retention (Fiol 2003; Van der Sluis 2004). The impact of human resources practices on knowledge retention pertains to retaining the most knowledgeable workers (Schenk 2003), effective career development and mentoring processes that help build knowledge (DeLong 2004) and training processes that take the needs of different age generations of the workforce into consideration (Juliano 2004). Furthermore, the application of performance evaluation processes could enhance or impede the practice of knowledge behaviours (for example, linking rewards to observing the desired knowledge behaviours) (DeFillippi & Ornstein 2003).

The carriers of knowledge

The *carriers of knowledge* in an organisational context operate at individual, group and organisational levels, while interacting with the external environment. In this context, it is important to determine the *types* of knowledge and *whose* knowledge might be lost to the organisation. The types of knowledge that could be lost at the individual level relate to the personal knowledge and knowing of individuals that resides in the heads/minds of people (Campos & Sánchez 2003). Li and Goa (2003) refer to this type of knowledge as "tacit knowing" and describe it as "elusive and subjective 'awareness' of [an] individual that cannot be articulated in words". To McInerney (2002), tacit knowledge is unspoken and hidden. It is the assumptions and expertise of individuals that develop over years and may never be documented or recorded. In other words it is experience-based, subconscious, perceived, held within self, transferred through conversations and demonstration, and embedded in stories and narratives.

At the group level, the type of knowledge that is at risk of loss is the collective tacit knowledge that develops communally over time through group interactions (Baumard 2001, in McInerney 2002; Leonard & Sensiper 2002). This type of knowledge could be lost when more than one person from a particular group or community leaves the organisation, or when it comes to specific problem-solving in the group that requires the knowledge and experience of individual experts who might have left the organisation. An important part of social knowledge that resides within individuals is the relationships with people inside and outside the organisation, in other words, who they know and collaborate with to get their work done on time and effectively. Individuals rarely get things done on their own, as they need to rely on both co-workers and relationships with external parties. An example is the trusted contracts that people have with, for instance, external customers (Parise, Cross & Davenport 2006).

Organisational knowledge is accumulated know-how, expertise and ways of working, and it is greater than the sum of the currently employed individuals' expertise (Quintas 2002; Allee 2003). The know-how may exist as tacit knowledge in people's heads in the form of skills and intuitions (Cummings & Worley 2005) and collectively make up organisational knowledge. Organisational knowledge may be affected when large numbers of employees are close to retirement or specific industry professionals are in great demand at other organisations. DeLong (2004) describes the example of the US nuclear weapons industry, which is concerned about losing knowledge of how to safely design and test nuclear weapons, because so many nuclear scientists and engineers are retiring.

DeLong (2004) refers to *cultural knowledge* and *structural knowledge* as knowledge that could be lost at the organisational level. Cultural knowledge is the collective understanding of how to behave and think in an organisation. Haldin-Herrgard (2000) also mentions cognitive mental maps, values and organisational culture as collective forms of tacit knowledge. The learning of organisational culture or cognitive schemes (mental maps) occurs over time and through participation and interaction in the organisation (Leonard & Sensiper 1998, in Haldin-Herrgard 2000). Organisational culture is modelled, and people are not always aware that tacit knowledge is shared (Haldin-Herrgard 2000). This cultural knowledge can be affected if an organisation experiences very high levels of turnover, for instance if most of the sales staff leave (DeLong 2004) or if the top leadership is affected by retirements or turnover. Structural knowledge is embedded in the routines, processes, tools and systems (Cummings & Worley 2005; DeLong 2004; Quintas 2002). This knowledge is explicit and rules-based, and it lies outside the scope of the tacit know-how, in other words it exists independently of human knowers (DeLong 2004) and is not as much at risk of loss as is the tacit know-how (Droege & Hoobler 2003).

Besides indicating what type of knowledge is at risk of loss, the carriers of knowledge are physically present in organisations, and it is therefore important to consider *whose knowledge* is at risk of loss and must be retained. *Retention of knowledge* can be defined as maintaining, rather than losing, important knowledge that exists in the heads of people (and is not easily documented) and that is important to the overall functioning of the organisation. It is impossible to retain all the tacit knowing that exists in an organisation, but the literature points out certain categories of people whose knowledge it is critical to retain. Seidman and McCauley (2005) suggest that organisations should identify their *best performers* with a view to focusing on critical knowledge loss regardless of employees' age.

Organisations are increasingly building their strategies around the competitive advantage that the knowledge of their '*specialist employees*' can provide (Reich, in

Blackler, Crump & McDonald 1998). Individuals with expertise are able to create uniquely new knowledge and solutions in their fields of expertise, will have the most relevant and up-to-date knowledge to perform tasks optimally, and will know what is really happening and what should happen (Wraige 2004). Expertise is built over a long period of time through education, training and experience and remains with the individual person (Bender & Fish 2000). Some examples of experts that might be lost to an organisation are expatriates who work on global assignments or contract workers moving to other organisations, whose expertise needs to be retained (Bender & Fish 2000; Parise et al. 2006). Another characteristic of expertise refers to the knowledge of people who have substantial *relationships* within or outside their organisations, for example with customers and stakeholders. This type of expertise refers to critical knowledge about who these experts know (Parise et al. 2006). Wraige (2004) writes that the knowledge of experts should be gleaned efficiently in organisations in an attempt to prevent critical knowledge loss.

It appears from the literature that each organisation has a *few key people* whose knowledge is of crucial importance to the survival of the organisation. Bill Gates once commented that if 20 of Microsoft's key people were to leave, his company would risk bankruptcy (Bahra 2001). Leonard (2005) also refers to every organisation as having a few key people whose departure would devastate operations.

DeLong (2004) refers to organisations that might be faced with a *leadership* crisis when taking their long-term human capital needs into consideration. According to Bahra (2001), one of the most significant contributions of leaders is to "create specialist knowledge workers". The challenge seems to be to find ways of transferring the experiential knowledge of leaders to the next generation of leaders. Organisations should be aware of who their critical leaders are.

Foster (2005) refers to fear of brain drain in specific industries, for example technology and pharmaceutical industries that are facing the loss of professional positions such as engineers, accountants, salespeople and senior managers. In South Africa, large numbers of medical practitioners and dentists have gone abroad (Salie 2006), which has led to an increased loss of knowledge in these professions. Organisations might need to determine whether there are any *professional positions* (such as engineers, information technology professionals or accountants) in the organisation that might be affected by large amounts of knowledge loss due to high turnover.

DeLong (2004) states that a growing number of organisations are facing a significant increase in *retirements* in the years ahead, given the current age demographics, specifically aging baby-boomers. The baby-boomer generation is classified as the workforce that was born between 1946 and 1964 (Garlick & Langley

2007). Parise et al. (2006) state that certain industries, such as the oil and gas industry, are facing an impending crisis, in which it is estimated that 60% of experienced managers will retire by 2010. It appears that it is essential to retain critical knowledge that might be lost as a result of employees approaching retirement.

Strategic risks of knowledge loss

During the growth spurt of the 1990s, organisations started managing knowledge as a strategic capability. Lesser and Prusak (2001) pointed out that organisations applied resources and time to enhance their ability to create, share and apply individual and collective know-how. A wide range of knowledge management initiatives were implemented, such as identifying and sharing relevant practices, locating and highlighting expertise, encouraging communities of practice and installing collaborative technology systems. An era of uncertainty has ensued, with changes such as shrinking budgets, staff reductions, job-hopping, an aging workforce and skills losses in many sectors – including health care, manufacturing, education, aeronautics, law, foodstuffs, government, the media, telecommunications, financial services, retail, advertising/marketing, information technology and university administration – which have put knowledge at risk (DeLong 2004; Kransdorff 2003; Lesser & Prusak 2001). The loss of organisations' valuable knowledge would have a *strategic impact* on their business. It is therefore important to identify where lost knowledge could have a threatening effect on the implementation of the organisation's strategy. This means that the organisation needs to determine in advance which knowledge, if lost, could undermine the organisational strategy (DeLong 2004).

DeLong (2004) has identified five ways in which this could happen. Organisations following a strategy of innovation should be particularly concerned when they lose the experience and expertise associated with the knowledge needed for the development of new products and services or when senior people retire, as these instances could slow down innovation. Organisations that pursue a growth strategy could lose this ability due to turnover and retirements. Furthermore, retirements could also reduce the availability of potential mentors to new employees. When people leave, efficiency is lost, which in turn affects cost-cutting strategies; and simply adding more human resources is not a viable solution. DeLong (2004) suggests that organisations faced with this situation should identify what knowledge, if lost, would undermine their productivity gains and what knowledge must be retained to support continuous performance improvements. When senior and very knowledgeable people leave an organisation, they could take with them knowledge that afforded the organisation a competitive advantage, for instance extensive personal relationships with decision-

makers in major customer organisations. Losing that experience and knowledge would open the way for competitors to steal away major accounts. Other variations of losing knowledge to competitors are the inability to retain people with certain specialised skills (such as key engineers), which competitors have managed to retain; and transferring the latest technology to other organisations due to contract deals that might be used against the original owner of the technology (Behrend 2006). Losing specific knowledge at the wrong time could increase vulnerability and pose a threat to strategy implementation. This is particularly true of relatively new knowledge, which is more vulnerable to loss than it would be after a few years. The organisation therefore needs to identify areas where it has a competitive advantage through specialised knowledge, and where the risks of losing specific knowledge lie (DeLong 2004).

Theoretical model of factors to be taken into consideration to combat knowledge loss

A theoretical model that identifies the factors that need to be taken into consideration in addressing the issue of knowledge loss was developed based on investigation of the manifestation of knowledge in organisations in the context of knowledge loss and retention. This model is shown in Figure 3.

The model portrays, firstly, that external forces of change (such as the nature of the workforce, economic shocks, competition and a world recession) would have an influence on the retention of knowledge in an organisation. The forces of change exist in the external environment of organisations and affect the internal operations of organisations. This implies that organisations need to manage the changes that these forces bring about and be aware of the impact of work stress conditions on knowledge behaviours and organisational effectiveness. Secondly, human input factors play a role within the organisation in terms of knowledge loss, as opposed to knowledge retention.

The three main components of the human input factors that have emerged in this research are: the manifestation perspective of knowledge in both mind and body pertaining to identifying knowledge-loss risks (whose and what type), the behavioural perspective (knowledge behaviours, threats and enhancers) and the organisational perspective (strategic risks of knowledge loss). One component of the model, namely the behavioural threat/enhancer component, is based on the organisational behaviour model of Robbins (2005) pertaining to the behavioural threats that could impede or enhance knowledge retention. It is clear that several factors need to be taken into consideration to combat the loss of tacit knowledge. The knowledge loss risks should

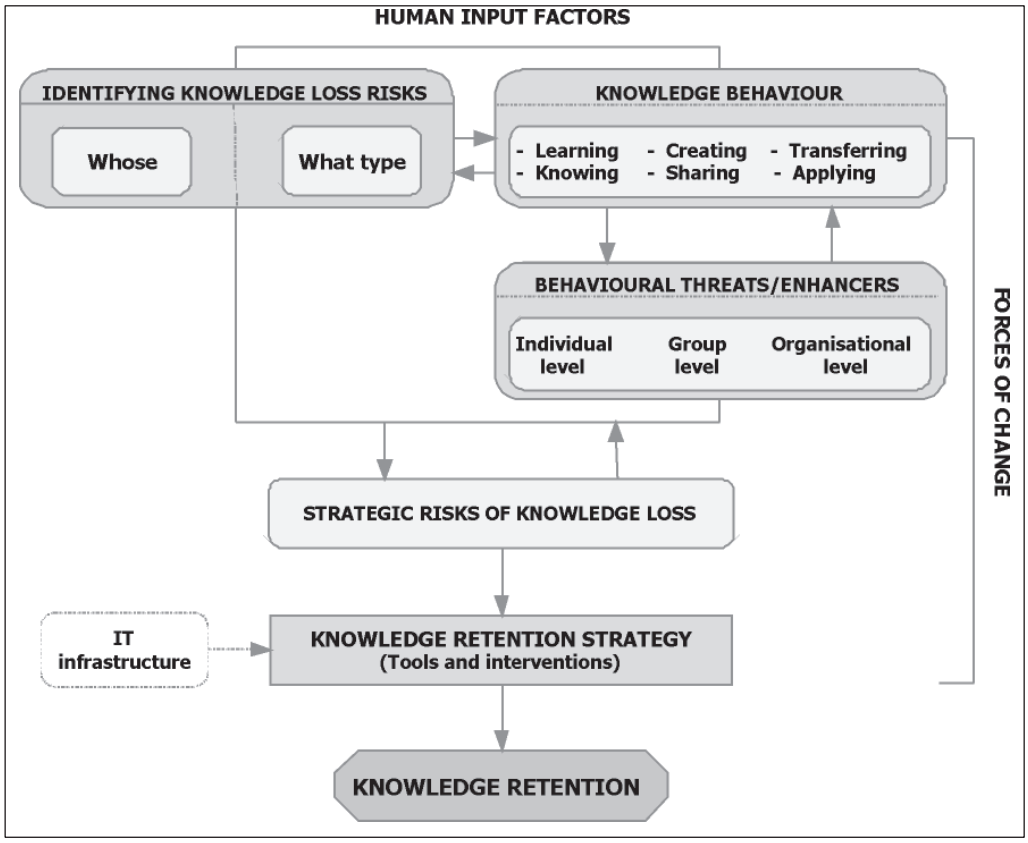

Figure 3: Theoretical Model: Identifying the Factors that would Enhance or Impede Tacit Knowledge Retention

be determined in terms of whose knowledge and what type of knowledge is at risk of loss. Knowledge behaviours need to be demonstrated in order to contribute to knowledge retention. The behavioural threats that are manifested in the demonstration of knowledge behaviours could cause knowledge loss, whereas behavioural enhancers could bring about the retention of critical tacit knowledge. In turn, these behavioural enhancers or threats would affect the manifestation of the knowledge behaviours. The behavioural factors manifest at the individual, group and organisational levels, and are interlinked in many instances. All these human input factors have an impact on the implementation of the strategy of the organisation, and it is therefore important to determine the strategic risks of losing knowledge. The strategic risks, in turn, would have an impact on the human input factors (for example, when the knowledge needed to be innovative is lost, the creation of new

knowledge would be difficult. It would be difficult for an organisation to implement its strategy if critical knowledge were lost.

Taking all these factors into consideration, it might be possible to determine the extent to which these factors impact on possible knowledge loss. Once the inhibiting factors that would prevent knowledge retention have been identified, a knowledge retention strategy could be implemented with the intention of retaining critical tacit knowledge within the organisation, thus ensuring organisational effectiveness and competitive advantage. As part of a holistic approach to knowledge retention, the information technology (IT) infrastructure aspect cannot be altogether ignored, and certain IT tools might be implemented to assist in retaining tacit knowledge.

Conclusions

This article has discussed the risks of knowledge loss and the challenges of knowledge retention in organisations. It can be concluded that knowledge is not easy to conceptualise and contextualise, as it cannot be placed into strict categories. It could be argued that knowledge at a cognitive level (learning and knowing) and knowledge development as a process (creating, sharing, transferring and applying) provide a useful framework for investigating the meaning of knowledge in the knowledge loss and retention context of organisations. Knowledge at a cognitive level and knowledge development as a process are manifested in the behaviours of employees working in an organisation. These manifestations could cause either tacit knowledge loss or the retention of tacit knowledge. The carriers of knowledge are related to whose and what type of knowledge might be at risk of loss to the organisation, and identifying these risks would indicate to an organisation where to focus its attempts to retain critical tacit knowledge. Knowledge loss could have an impact on the implementation of the strategy of an organisation. The strategy that an organisation pursues would indicate where to look for risks to knowledge loss and what type of behaviours to encourage that would enhance knowledge retention. The model developed in this research provides a *theoretical* framework of the organisational factors that need to be considered to retain critical knowledge in organisations so as to ensure their competitive advantage and deliver the best service to their customers. To gain a better understanding of knowledge loss and its impact on organisations, it is proposed that the theoretical model be tested empirically to determine which aspects need to be taken into consideration to retain knowledge in organisations.

References

Alavi, M. & Tiwana, A. 2003. 'Knowledge management: The information technology dimension', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Allee, V. 2003. *The Future of Knowledge: Increasing Prosperity through Value Networks*. Amsterdam: Butterworth-Heinemann.

American Productivity and Quality Centre. 2002. *Retaining Valuable Knowledge: Proactive Strategies to Deal with a Shifting Work Force.* Consortium Learning Forum best-practice report. [Online] Available at: http://www.apqc.org. Accessed: 25 October 2002.

Bahra, N. 2001. *Competitive Knowledge Management*. Houndmills: Palgrave.

Behrend, F.D. 2006. 'Collaborate today, compete tomorrow: Techniques for KM in inter-organizational relationships', *Knowledge Management Review,* 8(6): 24–27.

Bender, S. & Fish, A. 2000. 'The transfer of knowledge and the retention of expertise: The continuing need for global assignment', *Journal of Knowledge Management,* 4(2): 125–137.

Bennet, A. & Bennet, D. 2004. *Organizational Survival in the New World: The Intelligent Complex Adaptive System*. Amsterdam: Elseiner.

Blackler, F., Crump, N. & McDonald, S. 1998. 'Knowledge, organizations and competition', In Von Krogh, G., Roos, J. & Kleine, D. (eds), *Knowing in Firms: Understanding, Managing and Measuring Knowledge.* London: Sage.

Bock, G-W., Zmud, R.W., Kim, Y-G & Lee, J-N. 2005. 'Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate', *MIS Quarterly*, 29(1): 87–111.

Bryson, J., Pajo, K., Ward, R. & Mallon, M. 2006. 'Learning at work: Organisational affordances and individual engagement', *Journal of Workplace Learning,* 18(5): 279–297.

Calhoun, M.A. & Starbuck, W.H. 2003. 'Barriers to creating knowledge', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Campos, E.B. & Sánchez, M.P.S. 2003. 'Knowledge management in the emerging strategic business process: Information complexity and imagination', *Journal of Knowledge Management*, 7(2): 5–17.

Child, J. & Rodriques, S. 2003. 'Social identity and organizational learning', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Choo, C.W. 2003. 'Perspectives on managing knowledge in organizations', Williamson, N.J. & Beghtol, C. (eds), *Knowledge Organization and Classification in International Information Retrieval.* Binghamton, NY: Haworth Information Press.

Chou, S. & Tsai, Y. 2004. 'Knowledge creation: individual and organizational perspectives', *Journal of Information Science*, 30(3): 205–218.

Cools, E. & Van den Broeck, H. 2006. 'Values, attitudes and emotions', In Buelens, M., Van den Broeck, H., Vanderheyden, K., Kreitner, R. & Kinicki, A. (eds), *Organisational Behaviour* (3rd edition). London: McGraw-Hill.

Crossan, M. & Hulland, J. 2002. 'Leveraging knowledge through leadership of organizational learning', In Choo, C.W. & Bontis, N. (eds), *The Strategic Management of Intellectual Capital and Organizational Knowledge.* Oxford: Oxford University Press.

Cummings, T.G. & Worley, C.G. 2005. *Organization Development and Change* (8th edition). [S.l.]: Thomson.

Danskin, P., Englis, B.G., Solomon, M.R., Goldsmith, M. & Dave, R. 2005. 'Knowledge management as competitive advantage: Lessons from the textile and apparel value chain', *Journal of Knowledge Management*, 9(2): 91–102.

DeFillippi, R. & Ornstein, S. 2003. 'Psychological perspectives underlying theories of organizational learning', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

DeLong, D.W. & Davenport, T. 2003. 'Better practices for retaining organizational knowledge: Lessons from the leading edge', *Employment Relations Today*, 30(3): 51–63.

DeLong, D.W. 2004. *Lost Knowledge: Confronting the Threat of an Aging Workforce.* Oxford: Oxford University Press.

Devos, G. & Willem, A. 2006. 'Change, learning and knowledge management', In Buelens, M., Van den Broeck, H., Vanderheyden, K., Kreitner, R. & Kinicki, A. (eds), *Organisational Behaviour* (3rd edition). London: McGraw-Hill.

Doyle, S. 2004. 'Lost knowledge: Confronting the threat of an aging workforce', *People Management*, 10(25): 45.

Droege, S.B. & Hoobler, J.M. 2003. 'Employee turnover and tacit knowledge diffusion: A network perspective', *Journal of Managerial Issues*, XV(1): 50–61.

Fang, S-C. & Tsai, F-S & Chang, K-C. 2005. 'Knowledge sharing routines, task efficiency and team service quality in instant service-giving settings', *Journal of American Academy of Business,* 6(1): 62–67.

Fiol, C.M. 2003. 'Organizing for knowledge-based competitiveness: About pipelines and rivers', In Jackson, S.E, Hitt, M.A. & DeNisi, A.S. (eds), *Managing Knowledge for Sustained Competitive Advantage: Designing Strategies for Effective Human Resource Management.* San Francisco, CA: Jossey-Bass.

Frank, D.F., Finnegan, R.P. & Taylor, C.R. 2004. 'The race for talent: Retaining and engaging workers in the 21st century', *Human Resource Planning*, September: 12–25.

Foss, N.J. & Mahnke, V. 2003. 'Knowledge management: What can organizational economics contribute?', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Foster, L. 2005. 'Confronting the global brain drain', *Knowledge Management Review*, 8(5): 28–31.

Garlick, R. & Langley, K. 2007. 'Reaching Gen Y on both sides of the cash register: As customers and retail employees', *Insight Newsletter*, 10: 1–9.

Gibson, J.L., Ivancevich, J.M. & Donnelly, J.H. 1994. *Organizations* (8th edition). Burr Ridge, Il: Irwin.

Haldin-Herrgard, T. 2000. 'Difficulties in diffusion of tacit knowledge in organizations', *Journal of Intellectual Capital*, 1(4): 357.

Hayes, N. & Walsham, G. 2003. 'Knowledge sharing in ICT's: A relational perspective', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Juliano, J.J. 2004. 'Gen-X and Gen-Y: Teaching them the business', *Public Utilities Fortnightly*, 142(6): 82–85.

Kransdorff, A. 2003. 'How to debrief and cut the high cost of staff churn', *New Zealand Management*, 50(1): 42–43.

Leonard, D. & Sensiper, S. 2002. 'The role of tacit knowledge in group innovation', In Choo C.W. & Bontis, N. (eds), *The Strategic Management of Intellectual Capital and Organizational Knowledge.* Oxford: Oxford University Press.

Leonard, D. 2005. 'How to salvage your company's deep smarts; the approaching exodus of retiring baby boomers will severely erode the knowledge base of many companies. Fortunately there are ways to re-create this crucial expertise', *CIO*, 18(14): 1–2.

Lesser, E. & Prusak, L. 2001. 'Preserving knowledge in an uncertain world', *MIT Sloan Management Review*, 43(1): 101–102.

Li, M. & Goa, F. 2003. 'Why Nonaka highlights tacit knowledge: A critical review', *Journal of Knowledge Management*, 7(4): 6–14.

Lin, C-P. 2007. 'To share or not to share: Modeling tacit knowledge sharing, its mediators and antecedents', *Journal of Business Ethics*, 70: 411–428.

Mahee, R. 2006. 'Understanding knowledge sharing: A theoretical framework based upon the OCB construct', *International Journal of Knowledge Culture and Change Management*, 6(6): 73–79.

McInerney, C. 2002. 'Knowledge management and the dynamic nature of knowledge', *Journal of the American Society for Information Science and Technology*, 53(12): 1009–1018.

Minbaeva, D.B. & Michailova, S. 2004. 'Knowledge transfer and expatriation in multinational corporations', *Employee Relations*, 26(6): 663–679.

Nonaka, I., Toyama, R. & Konno, N. 2002. 'SECI, Ba and leadership: A unified model of dynamic knowledge creation', In Little, S., Quintas, P. & Ray, T. (eds), *Managing Knowledge: An Essential Reader.* London: Sage.

Ojha, A.K. 2005. 'Impact of team demography on knowledge sharing in software project teams', *South Asian Journal of Management*, 12(3): 67–78.

Parise, S., Cross, R. & Davenport, T.H. 2006. 'Strategies for preventing a knowledge-loss crisis', *MIT Sloan Management Review*, 47(4): 31–38.

Peltokorpi, V. 2006. 'Knowledge sharing in a cross-cultural context: Nordic expatriates in Japan', *Knowledge Management Research and Practice*, 4: 138–148.

Pickett, L. 2004. 'Focus on technology misses the mark', *Industrial and Commerce Training*, 36(6/7): 247–249.

Pollard, D. 2005. 'The future of knowledge', *Across the Board,* Jan–Feb 2005. Conference Board. [Online] Available at: http://blogs.salon.com/0002007/stories/2005/01/12/theFutureOfKnowledge.html. Accessed: 20 October 2005.

Quintas, P. 2002. 'Managing knowledge in a new century', In Little, S., Quintas, P. & Ray, T. (eds), *Managing Knowledge: An Essential Reader.* London: Sage.

Robbins, S.P. 2005. *Organizational Behavior* (11th edition). Upper Saddle River, NJ: Pearson Prentice Hall.

Salie, I. 2006. 'First doctors, now dentists, head overseas', *Saturday Weekend Argus,* 9 December, p. 6.

Salk, J.E. & Simonin, B.L. 2003. 'Beyond alliances: Towards a meta-theory of collaborative learning', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Salopek, J.J. 2005. 'The new brain drain', *T+D. Alexandria*, 59(6): 23–25.

Schenk, H. 2003. 'Human resource policies and practices', In Robbins, S.P, Odendaal, A. & Roodt, G. (eds), *Organisational Behaviour: Global and Southern African Perspectives.* Cape Town: Pearson.

Seidman, W. & McCauley, M. 2005. 'Saving retiring knowledge workers' "secret source"', *Performance Improvement*, 44(8): 34–38.

Szulanski, G. & Cappetta, R. 2003. 'Stickiness: Conceptualizing, measuring and predicting difficulties to transfer knowledge within organizations', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Taylor, S. & Osland, J.S. 2003. 'The impact of intercultural communication on global organisational learning', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management.* Malden, MA: Blackwell.

Tobin, P.K.J. & Volavsek, P. 2006. 'Knowledge management measurement in South African organizations', *Mousaion*, 24(1): 96–118.

Tsai, M-T. & Tsai, L-L. 2005. 'An empirical study of the knowledge transfer methods used by clinical instructors', *International Journal of Management*, 22(2): 273–284.

Van der Sluis, L. 2002. 'Learning behaviour and learning opportunities as career stimuli', *Journal of Workplace Learning*, 14(1):19–29.

Van der Sluis, L.E.C. 2004. 'Designing the workplace for learning and innovation: Organizational factors affecting learning and innovation', *Development and Learning in Organizations*, 18(5): 10–13.

Venzin, M., Von Krogh, G. & Roos, J. 1998. Further research into knowledge management', In Von Krogh, G., Roos, J. & Kleine, D. (eds), *Knowing in Firms: Understanding, Managing and Measuring Knowledge*. London: Sage.

Vera, D. & Crossan, M. 2003. 'Organizational learning and knowledge management: Toward an integrative framework', In Easterby-Smith, M. & Lyles, M.A. (eds), *The Blackwell Handbook of Organizational Learning and Knowledge Management*. Malden, MA: Blackwell.

Von Krogh, G., Ichijo, K. & Nonaka, I. 2000. *Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*. Oxford: Oxford University Press.

Wong, W.L.P. & Radcliffe, D.F. 2000. 'The tacit nature of design knowledge', *Technology and Strategic Management*, 12(4): 493–512.

Wraige, H. 2004. 'The power of knowledge', *Professional Engineering*, 17(17): 36–37.