

The role of people in knowledge management and corporate intelligence

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Abstract

A real-life intervention to improve the efficacy of an organisation's electronic document management system (EDMS) is reflected upon. The organisation implemented an EDMS without ensuring 'buy in' from the staff. Against the backdrop of the knowledge/innovation economy or information society, the relevance of knowledge management and knowledge agility is reviewed in brief. The importance of aligning human resource management practices with knowledge management is addressed in brief. The business case for the intervention is discussed and the unfolding of the intervention outlined. Thereafter the discussion is expanded to three generations of knowledge management, a brief look at the learning organisation, and complexity theory.

“if people are doing the wrong things when you automate, you get them to do the wrong things faster” — Bowen (Clark, 1993, p. 22).

Introduction to R&D.Com

This presentation is based on a real-life case study of an organisation, which for ethical reasons shall be known as R&D.Com. The organisation started in the 1930s as a small laboratory. Today it is world-renowned and prides itself on its services and products implemented in Europe, the Middle East, North & South America and Africa. The mission of R&D.Com, a proudly South African founder member, is to serve South Africa by promoting technology, industrial growth, and human development. R&D.Com's core objectives are to:

- add value to South Africa's natural resources
- expand the country's technology
- develop the related industries in the SADC and throughout Africa
- support the growth of SMME's in the related sector
- transform R&D.Com's business practices and staff profile

Implementation of Electronic Document Management at R&D.Com

During 1999 R&D.Com explored various electronic document management systems (EDMS). At the time, R&D.Com's information

systems were largely paper-based and all documentation related to a project often not filed consistently, with the result that important documents were at times unavailable or lost. Further vulnerabilities included entire files that went missing because document tracking was not automated and monitored. R&D.Com further wanted to improve the productivity of its R&D staff as well as to cut down on R&D.Com's large volumes of paper usage. R&D.Com wanted to ensure that all relevant information generated was retained and easily accessible to those with the applicable access rights.

The EDMS that R&D.Com chose, offered the essential elements of electronic document management (EDM), such as extensive search and retrieval capabilities, check-in/check-out, version control, audit trails, seven levels of security, and storage management. Apart from the server software, the product offered two interfaces:

- A Windows interface that offered the full functionality of EDM, including saving, editing and sharing of documents. Due to cost constraints, R&D.Com purchased only 25 licences, distributed to the secretaries and some administrative officers. All documents could then be routed via them to the EDMS. At that stage the secretaries in R&D.Com were still responsible for the typing of most of the documents.
- A browser-enabled interface that allowed all staff members to access the documents stored in the EDMS. R&D.Com purchased only 25 concurrent licences, which were customised as read-only licences. Staff with access to this interface were only able to search, view, get a copy and view the history of documents that had been stored on the EDMS. This was essentially a business decision, since R&D.Com could not afford more full licences.

R&D.Com further acquired a document imaging facility, which enabled the scanning of all incoming mail and other paper documentation into the EDMS. In R&D.Com the Registry department handles all incoming mail, distributes the paper documentation around R&D.Com, and files the information in the correct physical file after a log has been completed.

The local supplier of the EDMS carried out various functional specification meetings at R&D.Com during August 1999 and customised the software accordingly. From the functional specification meetings held, it became evident that there was no structure within R&D.Com when it comes to saving electronic documentation, and that each department or individual saved their documentation in their own peculiar format and structure of choice. The supplier expressed their concern in this regard and pointed out that there would need to be strong discipline from the users, enforced by management, to input the necessary information.

Designated users, mostly secretaries or administrative officers, were trained and started 'building' R&D.Com's EDMS. General users were given individualised demonstrations and provided with an on-line user manual. General users started placing documents on their divisional shared directories and advised the relevant designated user to add the document from there on to the EDMS. There is a standard R&D.Com operating procedure (SOP) in this regard.

At this point it is worth mentioning that St-Amour (2001) and Veldsman (2002) emphasise that for a transition to be successful, the 'buy in' and commitment of people are crucial. Both scholars identify three categories, which they respectively call: achievers/early adopters, adopters/late adopters and abstainers/laggards. St-Amour cautions that adopters (second category) are the most susceptible to influence and should therefore be a focal point to convert to the side of achievers, in order to create a critical mass of supportive people. He further cautions that abstainers typically make the most noise, and by paying too much attention to them achievers may feel ignored.

While R&D.Com made no effort to create a critical mass of people supportive of electronic document management, the knowledge economy (discussed in the next section) gained momentum.

The relevance of knowledge to R&D.Com and knowledge agility

Laszlo and Laszlo (2002) and Mehra (2001) make the point that the *knowledge economy is an emergent reality*, because no nation can any longer depend on its ability to acquire and convert raw materials. They point out that knowledge has emerged as a critical factor in controlling the global economy. In this regard they emphasise the significance of knowledge creation, learning, and innovation to the knowledge economy. Kraak (2000) highlights the paradoxical state of networking/co-operation and competition. In this regard McElroy (2000, p. 195) observes that "*corporate knowledge*¹ is now being viewed as the last and only sustainable untapped source of competitive advantage in business". Because *knowledge is theoretically infinite*², the aim is to get to the next important discovery first. According to Karamuftuoglu (1999), the knowledge-based economy, alternatively called *innovation economy or information society*, heralds the start of a period where humans will be liberated from mundane and often dangerous work. The knowledge-based economy will enable humans to channel their potential to more creative and challenging tasks.

¹ Alternative terms include intellectual capital, intellectual property, knowledge assets, or business intelligence.

² "Unlike other forms of capital - land, equipment, labor and money - ... [t]here is always a new idea waiting to be discovered - new ways of doing things, new products, new strategies, new markets" (McElroy, 2000, p. 195).

The commonly known three interacting elements of the 19th and 20th centuries were (a) raw materials, (b) machines, tools and auxiliary materials, and (c) human labour. Whereas the first two elements are consumed or depreciated in the production process, the value of human resources yields to the creation of new product or service value (Karamuftuoglu, 1999). In an ever-increasing attempt to reduce production costs, more and more automation is taking place, which unfortunately results in diminishing returns of technological investment. However, Karamuftuoglu (1999) argues, by shifting the focus to perpetual innovation and the production of new knowledge with regard to the making of goods or rendering services, business may sustain an increased rate of profit.

Megill (1997) states that in the electronic age, information is an asset that must be managed like all other assets. Information is created, stored, kept and used; it can be sold and traded; and it can be used and reused. When other assets are used for a specific purpose it can usually not be used for another. "Information, however, is different. Shared information is not lost. In fact, when information is shared and put into context, it often gains value for the creator as well as for the person with whom it is shared. Information is not only not a depletable resource, it is one that grows and thrives with use" (p. 2). [Information grows and prospers in an environment in which it is shared, used and reused](#). The better an organisation is able to share its information, the more valuable that information becomes. However, in R&D.Com's case, a needs analysis about document management recently undertaken revealed that the existing EDMS largely served as a repository of finalised documents and that very little collaboration and sharing of information took place. A main author or R&D official would be responsible for the production of a document. The perception among staff was that it was not necessary to participate in and collaborate via EDMS, with the result that most recent or current research, as well as tacit and implicit knowledge, would not necessarily form part of the corporate memory.

Laszlo and Laszlo (2002) observe that although knowledge has always been relevant to good business performance, the kind of knowledge required to develop and maintain a competitive edge varied. During the first half of the 20th century, successful business enterprises focused on the improvement of internal processes and production efficiency (see figure 1). However, competition and economic expansion necessitated the broadening of horizons. Contextual knowledge, including [benchmarks and best practices](#), gained importance during the second half of the 20th century. With the rapidly changing global environment of the 21st century, acquisition, generation, distribution and utilisation of knowledge has become a main source of value creation.

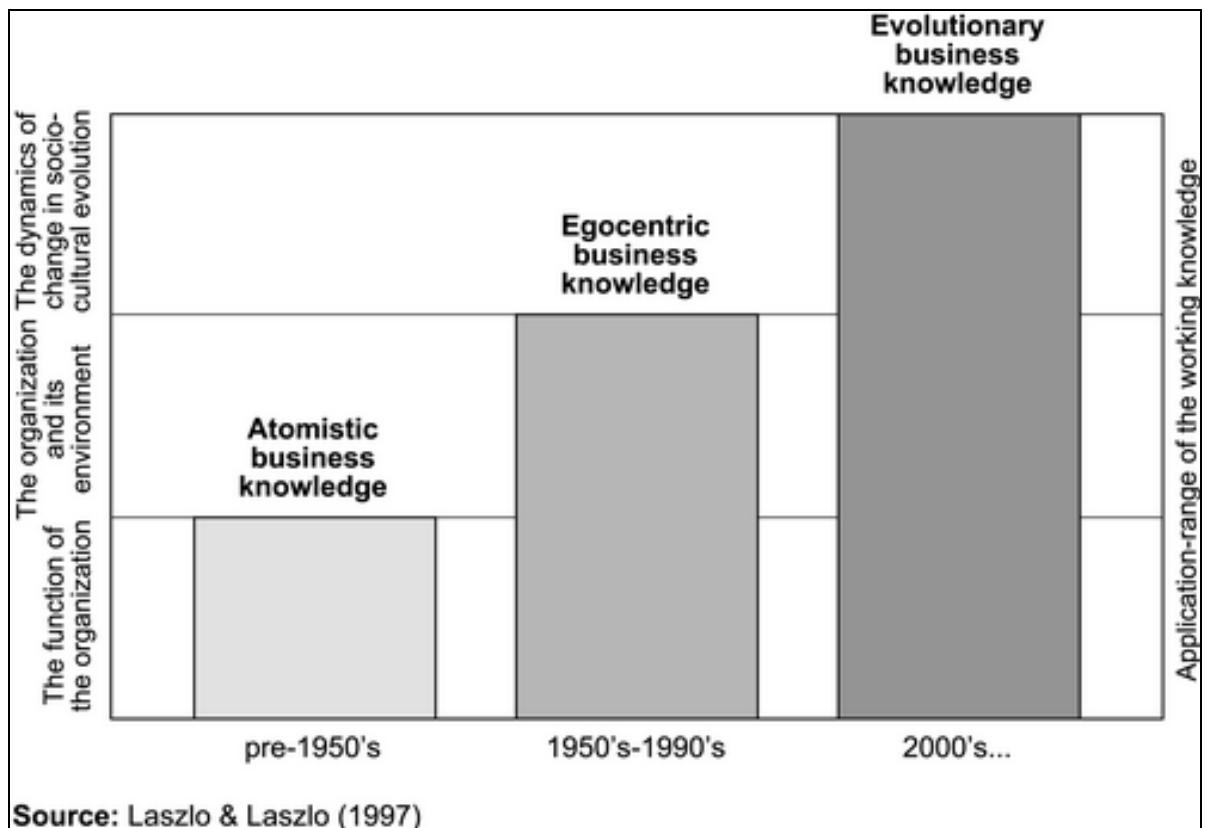


Figure 1: The three phases of the relevance of knowledge to enterprises (Laszlo & Laszlo, 2002, p. 401).

Within R&D.Com there is a very strong emphasis on quality management (in order to retain ISO 9001 certification) and environmental management (to acquire ISO 14001 recognition). Such an emphasis belongs within the egocentric business knowledge phase. It further appears that the evolutionary business knowledge phase has not taken root at R&D.Com.

Dove (1999, p. 1) postulates that “[new knowledge has no value until it is applied](#)”, and when it is, it introduces change into the environment, which generates value. Dove (1999), Meredith and Francis (2000) and Vernadat (1999) use the terms ‘*agility*’, an ‘*agile enterprise*’ or ‘*agile manufacturing*’. Dove associates the word *agile* with cats — both physically adept at movement and also mentally adept at choosing the appropriate movement in a given situation. Vernadat (1999, p. 37) defines agility as “the ability to closely align enterprise systems to changing business needs in order to achieve competitive performance”. Meredith and Francis (2000) support this definition by stating that in order to retain a competitive advantage, an enterprise needs to be aware of, and creatively respond to many elements within the competitive environment. Figure 2 represents Dove’s theory about organisation agility, namely the balance between knowledge management and the ability to respond in order to apply knowledge effectively. This notion of balance is of particular importance to R&D.Com, as it competes within the global environment.

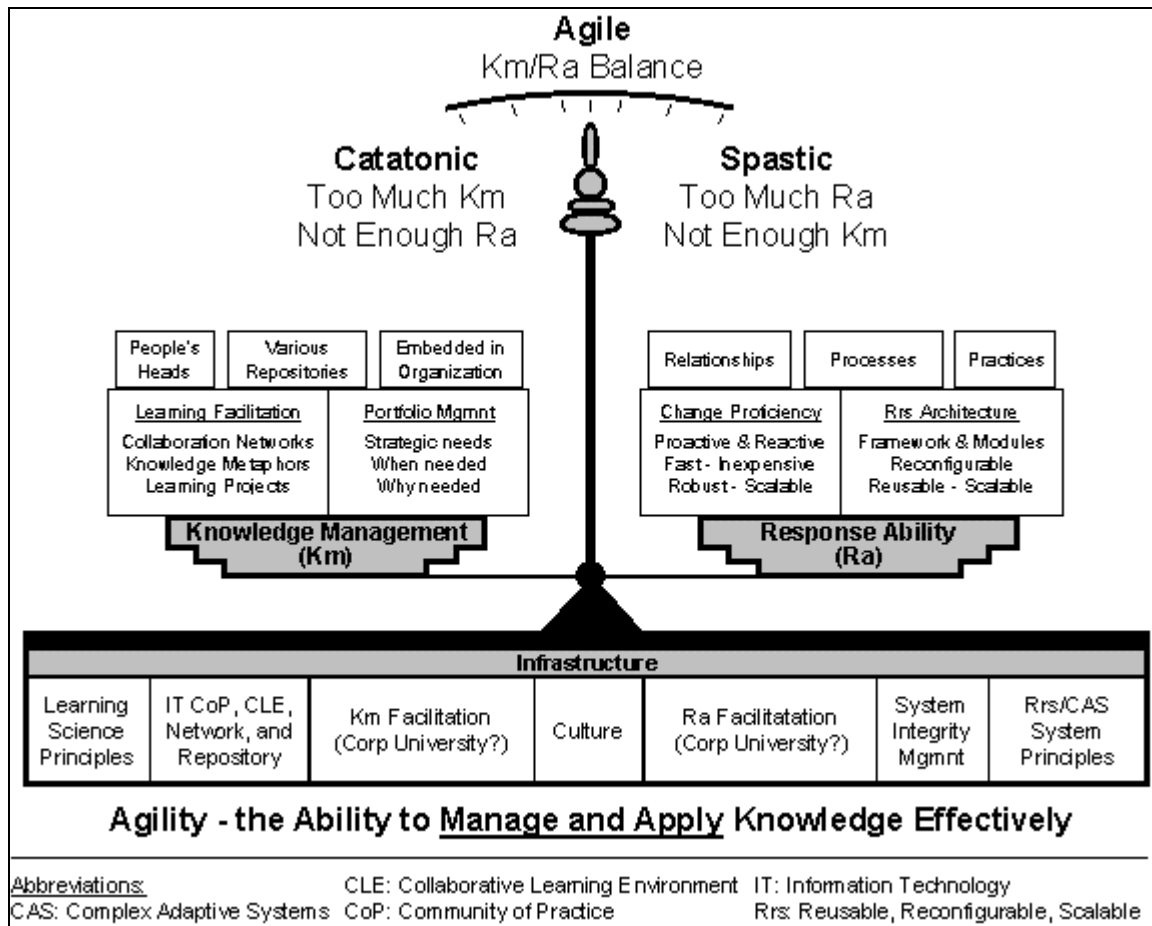


Figure 2: Agility = knowledge management + response ability (Dove, 1999, p. 2).

Similar to Vernadat's definition, Dove regards organisational agility as the ability of an organisation to thrive in a continuously and unpredictably changing environment. An over emphasis on knowledge management results in an organisational state of 'muscular rigidity'. However, an over emphasis on ability to respond results in involuntary sudden and violent organisational 'muscular contractions' or sudden convulsive movements. As a result of the escalating pace of knowledge development and the concomitant knowledge-value decay, organisations need to develop competence in knowledge agility.

Mehra (2001) reports that knowledge has been found to be a substantial influential factor with regard to the accelerated pace and magnitude of economic growth. Consequently, the concept of knowledge sharing and the use of knowledge have changed. *Knowledge* is preserved as *capital* and transformed by entrepreneurs into income and wealth. Knowledge remains capital as long as it remains the property of either an individual or an organisation. Karamuftuoglu (1999) highlights a number of key characteristics of knowledge:

- once produced it can easily be reproduced and transmitted at low

cost

- it can never be consumed or depleted
- to maintain a monopoly of knowledge is extremely difficult and knowledge tends to flow into the public domain
- therefore knowledge only retains an exchange value (price) as long as it is protected by copyright, patents, etc.

To remain competitive, an organisation needs to continuously develop new knowledge. The smallest unit of knowledge generation (according to Mehra) is the individual. He therefore concludes that **knowledge resides as human capital** or a knowledge pool (*infrastructure*). A dynamic relationship exists between knowledge capital and infrastructure. The inevitable flow of knowledge into the public domain, therefore becoming infrastructure, also adds to the dynamics. Related to knowledge management versus response, as well as knowledge capital versus infrastructure, is Vassallo's (1999) knowledge continuum (see figure 3). This continuum illustrates the various stages of the research process. The input side represents the introduction of knowledge to benefit both research discovery and activity, including the identification, selection, organisation and distribution of existing knowledge. The completion of Vassallo's circular continuum is achieved by the output side, which includes the research conclusion and research dissemination. The input side represents knowledge management, and the output side knowledge response. If a sound balance is maintained, knowledge agility is achieved.

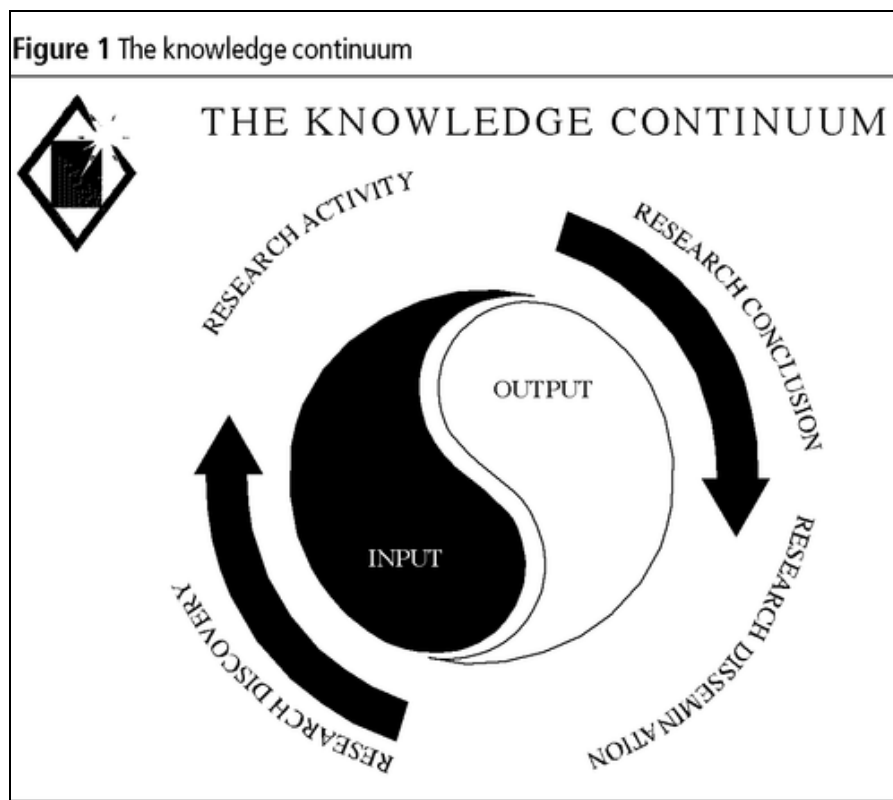


Figure 3: The input-output research continuum (Vassallo, 1999, p. 233).

It is suggested that R&D.Com should have taken note of the emerging knowledge economy and the impact thereof on EDMS. R&D.Com should have embraced the importance of corporate knowledge or intellectual capital and started using its EDMS to manage its knowledge assets. R&D.Com should have realised the fine balance of knowledge agility and used its EDMS to manage the dynamics of retaining knowledge as capital versus applying and sharing it. This paper next introduces the importance of aligning people management systems with knowledge management.

Knowledge management (KM) and human resource management (HRM)

Bender and Fish (2000) assert that knowledge management (KM) is not a programme, but a way of working. KM needs to be imbedded, through the organisational strategy, operations design and human resource management. They argue for a change of mind-set from “*knowledge = power, so hoard it*” to “*knowledge = power, so share it and it will multiply*” (p. 134, emphasis added). They make a plea for the abandonment of the tradition of knowledge hoarding.

Because [people are at the heart of KM, the success of KM depends on an organisation’s ability to manage its employees](#). KM therefore not only requires a change in organisational culture (to informality and openness in knowledge sharing), but profound changes in human resource management (HRM) practices — linking both KM and HRM to the business strategy (Bender & Fish, 2000; Carter & Scarbrough, 2001; Farquharson & Baum, 2002; Hislop, 2003; Mink *et al*, 1993; Swan *et al*, 1999; Yahya & Goh, 2002). The HRM practices these scholars mention include appraisals, compensation or rewards strategy, decision-making, education, employee relations, empowerment, the design of jobs, job descriptions, leadership, motivation, organisational development, performance-related pay, psychological contracting, recruitment and selection, teamwork, training and development, and trust. Carter & Scarbrough (2001) further see a symbiotic relationship between KM and HRM. Hong (1994) cautions about [dissonance](#) between KM and HRM practices going undetected. Hislop (2003) draws attention to a [disjuncture](#) between the [rhetoric and the reality](#) with regard to employment practices and point out indicators such as turnover and job security impacting negatively on KM.

None of the matters mentioned in this section had been considered with regard to the implementation of EDMS at R&D.Com, possibly because of the non-involvement of the HR department in the deployment of EDM. In addition, in the recent past R&D.Com had undergone three staff reduction phases (restructuring, early retirements and retrenchments), and the turnover of young R&D officers is a concern.

The next section returns to the R&D.Com case study and sketches the business case for the intervention.

A business case for the intervention

R&D.Com makes use of software to monitor the user activity on their Intranet. The software identifies each user based on the network user identification. Figure 4 indicates, for the period April 2002 to January 2003, (a) the number of unique users who accessed the EDMS, (b) which of these users visited once, and (c) which of these users visited more than once. During the three-month period (April – June 2002) prior to the intervention, an average of 20.7 unique users accessed the EDMS, of which 13.7 accessed it once and only 7 more than once. This represents only 15.1% of the 137 knowledge workers at R&D.Com; only 5.1% accessed the EDMS more than once per month.

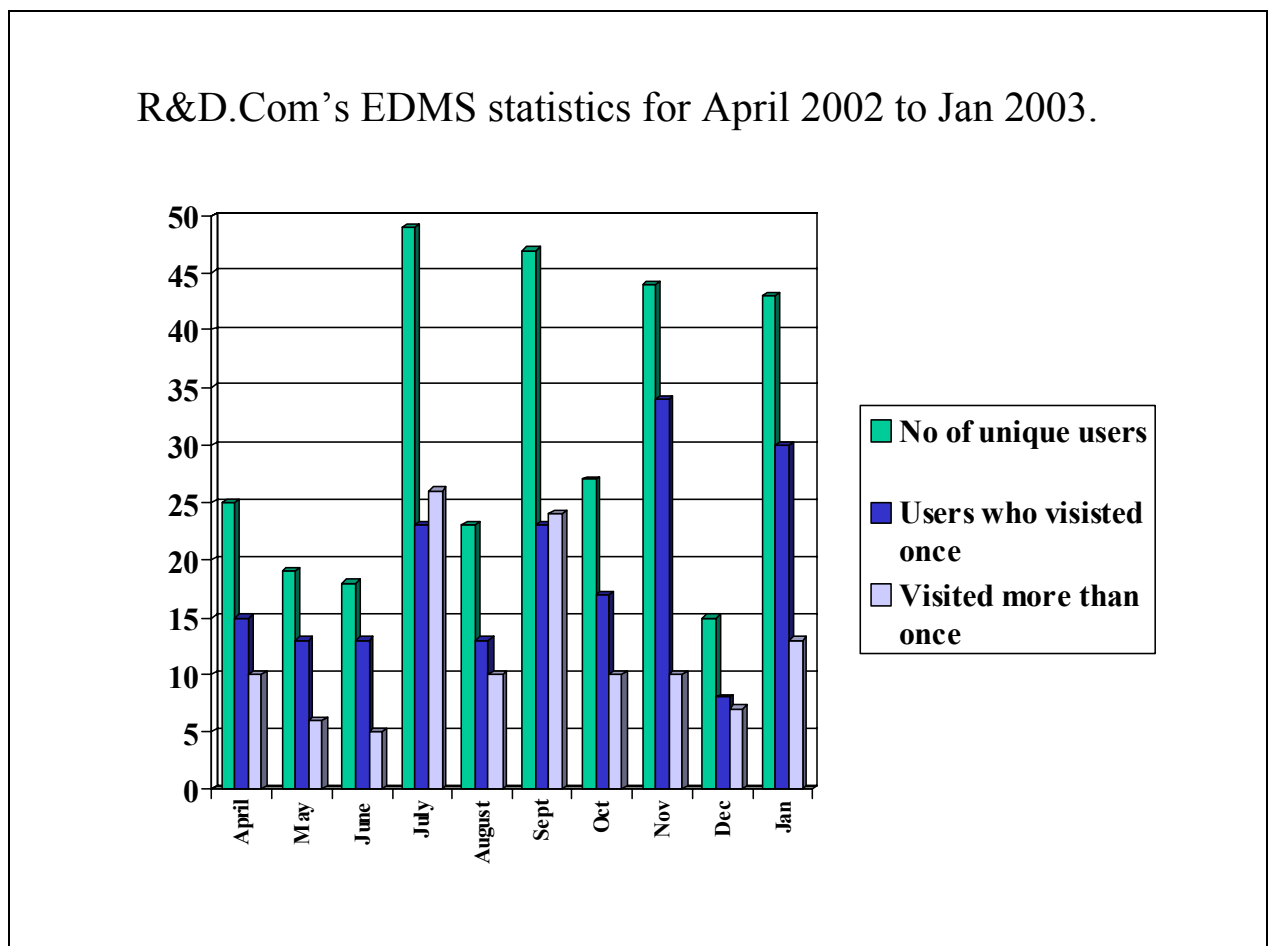


Figure 4: User statistics for the period April 2002 to January 2003.

Although a substantial body of documents (about 4200) had been saved to the EDMS over the two and a half years prior to the intervention, it appears as if document management at R&D.Com depend largely on the insistence (or lack thereof) of the secretaries or departmental administration officers. Executive management through to scientists, as

the knowledge leaders, were for the most part apathetic about the idea of electronic document management (EDM). For EDM to succeed at R&D.Com, this group had to be made aware of the role EDM could play in the productivity of the organisation as a whole. Furthermore, the actual EDMS document status (explicit knowledge) does not take into consideration the tacit knowledge (Hislop, 2003, p. 184; Yahya & Goh, 2002) "possessed by people (embrained and embodied ...) and ... locked in the human mind". In order to make this knowledge explicit, through either codification or personalisation, (Carter & Scarbrough, 2001) staff must be motivated to share the information.

In June 2002 one of the senior managers at R&D.Com expressed concern about the general usage efficacy of the EDMS. It was agreed that I would lead an intervention project, in close co-operation with the systems administrator and accountable to the head of the department responsible for information. The agreed objectives of the intervention were (i) to inculcate custodianship for the commercialisation & business corporate memory and knowledge repository among the various levels of management, and (ii) to ensure the user efficacy of both the dedicated input users and the general users.

In consultation with the systems administrator, the following deliverables were proposed to and approved by the project sponsor:

- Facilitation of a '*Commercialisation & Business EDMS*' session at a R&D.Com's management committee meeting, which included:
 - a briefing about the importance of corporate intelligence and electronic knowledge management with regard to R&D.Com's transition to being a commercially driven enterprise;
 - a work session to identify what types of documents ought to be captured on the EDMS; and
 - a discussion about the custodian role of managers with regard to the commercial & business corporate memory and knowledge repository.
- Facilitation of departmental level '*Commercialisation & Business EDMS*' sessions, with the departmental heads and their respective subordinates in attendance, which included:
 - a briefing about the importance of corporate intelligence and electronic knowledge management with regard to R&D.Com's transition to being a commercially driven enterprise;
 - a demonstration of the basic EDMS functions and suggested flow of information in R&D.Com;
 - a work session on the role of R&D.Com staff with regard to building the commercial & business corporate memory and knowledge repository; and

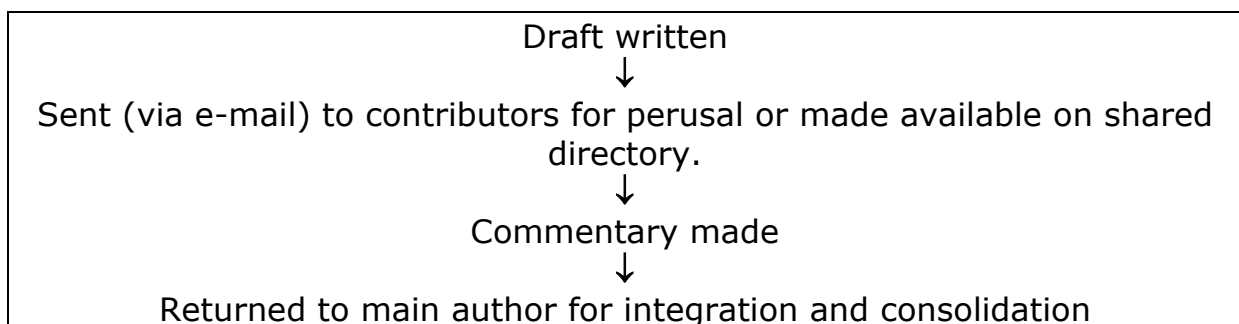
- identification of a departmental representative to serve on an EDMS user group.

The unfolding of the intervention

During the discussion that followed at the R&D.Com's management committee meeting, the need for a more in depth investigation regarding EDM became apparent. There are several electronic systems, each with a specific purpose, in use at R&D.Com. An appeal was made for a policy to clarify which types of documentation should be stored on which system and to consolidate electronic systems where possible. A working committee was formed for this purpose. However, the committee ignored their brief and instead questioned the requirements on which the selection of the existing EDMS was based. It was decided to start from scratch by identifying new requirements and possibly implement a different system to meet the current needs. This gave rise to phases 2 & 3 of the intervention.

Phase 2 entailed a needs analysis about document management. An extract from the report of a needs analysis survey, undertaken by means of structured interviews of a representative sample, is attached as appendix A. The survey uncovered a prevailing 'storage-and-retrieval' paradigm at R&D.Com, as well as an ignorance of what DM entails and a lack of management input. It also became clear that 'buy-in' would only be achieved if all staff members had full access to the EDMS, both to access and to store, edit and share information.

In R&D.Com the principal author of a document controls the input and is responsible for collating, editing, and ensuring that the tables and figures are correctly numbered. In extreme situations an appendix is stuck in at the back. The principal author signs off the document and takes responsibility for the content. They do not see collaboration as a function of EDMS. There is a concern that it would slow the process down. The general collaboration process is illustrated below.



The process illustrated above might go backwards and forwards multiple times. One participant labelled the process as diabolical: contributors send notes to each other, e-mail one another, meet each other — the

survey participant concluded that it is important for R&D.Com to collaborate. Another participant stated "I hate it (the R&D.Com process), it is so clumsy." In contrast to these two views some other participants were satisfied that MS Word's 'track changes' worked well for their purposes. However, another participant viewed an EDMS process as a recipe for disaster.

Phase 3 involved an extensive comparison of the existing EDMS to another, less expensive option proposed by the working committee, as well as guidelines on records management (RM) obtained from the National Archives of South Africa (NASA). The comparison resulted in the rejection of the proposed alternative EDMS. However, the cost of full licences of the existing EDMS for all staff members, together with the requisite upgrade of a large number of workstations, was considered to be too high. As R&D.Com, for most part, never experienced the full benefits of EDM, a cheap directory structure & retrieval solution proposed by their information technology (IT) department was accepted. This solution does not incorporate the basic principles of EDM.

While document management at R&D.Com seems to regress, some scholars identify two generations of knowledge management (KM), whereas others identify three generations of KM. The paper is concluded with a brief discussion of these, as well as the impact of the learning organisation and complexity theory on knowledge management.

Different generations of knowledge management, the learning organisation and complexity theory

Laszlo and Laszlo (2002), McElroy (2000), and Senge (1990) differentiate between two generations of *knowledge management* (KM). The *first generation focused on information indexing, retrieval and dissemination, usually through technology*. The second generation is about sustainable creation, transfer and dissemination of corporate knowledge. Whereas first-generation KM concentrated on *standards and benchmarks (imitation)*, the second promotes education and innovation.

McElroy (2000) points out that three otherwise separate communities of management practice are converging, because they share an intrinsically co-dependant view of KM. The communities involved in the meeting of minds are:

- the budding second KM community,
- the advocates of the *learning organisation* and systems thinking, and
- the supporters of the applications of *complexity theory* in business enterprises.

Complexity theory (or more precisely, the science of complexity) is the study of emergent order in what appear to be disorderly systems. "Spirals in whirlpools, funnels in tornadoes, flocks of birds, schools of fish — these are all examples of orderly behavior in systems that are neither centrally planned nor centrally controlled. How and why such coherence emerges in complex systems is a mystery. Nevertheless, understanding its influence on the performance of human organizations could lead to major gains in the conduct of human affairs, especially business" (McElroy, 2000, p. 196). Business enterprises are seen as just another group of complex systems because they display similar behaviours as those found in weather systems or animal populations. **Business enterprises are living systems** and should therefore be managed accordingly. MacIntosh and MacLean (2001) observed from a complexity theory perspective that system patterns are stable until they reach a critical threshold, the bifurcation point. At this point the stresses make the system unstable and far-from-equilibrium conditions develop, introducing the possibility of radical, qualitative change. At this point the system becomes open to its environment and susceptible to signals which would have had little impact during equilibrium.

The advocates of the **learning organisation, or organisational learning** (OL) practitioners (also known as 'organolearners') differentiate between what individuals know and collective knowledge. It is not just individuals, but also organisations that learn. Creative conflict tension between the two stimulates innovation and creativity. From phase 1 of the intervention at R&D.Com it was evident that individual or small groups of R&D officers do not necessarily share their work-in-progress with others in the organisation, other than those directly involved. Several intervention participants mentioned that work is often duplicated within different departments at substantial costs. In this regard, Yahya & Goh (2002) observe that in an individualistic working environment, such as R&D.Com appears to be, it is not realistic to expect employees to share knowledge willingly and contribute to the work of colleagues. Hislop (2003) cautions that scientists often regard of commitment to a profession more important than commitment to an employer. McElroy (2000) observes that established ways of doing must make way for more efficient ones. The well-known Arie De Gues, quoted by McElroy (2000, p. 199), eloquently made the point "The **ability to learn faster than your competitors may be the only sustainable competitive advantage**".

Ingelgård, Roth, Styhre and Shani (2002) point out that it would be a mistake to conclude that organisational learning is merely the accumulative result of individual learning. Although organisations do not have brains they do have cognitive systems and the corporate memory, which preserves behaviours, norms, values and mental maps. Ingelgård *et al* (2002) further point out that there are three perspectives on organisational learning:

- The normative perspective — OL only occurs under a unique set of conditions.
- The developmental perspective — where OL is seen as a late stage of organisational development.
- The capability perspective — presuming that learning is innate to all organisations, and there is no best way for all organisations to learn.

To the 'KM consortium', a think-tank of KM practitioners that holds an unconventional view, the management of knowledge has nothing to do with computer-based repositories. Their view is that "knowledge is the product of natural innovation schemes inherent to all living systems" (McElroy, 2000, p. 197). They postulate that the evolution of new knowledge will be the natural effect of the existence of conditions in which innovation thrives. Their mission is to "crack the secret of innovation" by promoting techniques to enable business "to out-learn, out-innovate, and out-perform their competitors" and to accelerate the production of new knowledge (McElroy, 2000, p. 197).

The second generation KM practitioners complain that KM to date largely "amounted to little more than a re-hash of yesterday's 'information management' schemes", which "have had little to do, if anything, with knowledge, *per se*" (McElroy, 2000, p. 199). However, Karamuftuoglu (1999) points out that retrieval, of especially previously unnoticed connections, still has a contribution to make regarding knowledge creation. The first wave of KM has been about repackaged information capturing, storage, access and retrieval systems sold under the guise of KM. The first generation KM schemes were about the enhancement of day-to-day business process performance. First generation KM is all about delivering information to support a task. However, Parker (1999) emphasises the importance of KM and the ability to recreate the organisation and its work from scratch after disasters such as that of 11 September 2001, New York. These different perspectives of KM highlight the importance of meaning, which is addressed in the next paragraph.

Laszlo and Laszlo's (2002, p. 404) 'pyramid of meaning' (see figure 5) contextualise the meanings of information and knowledge, mentioned in the previous paragraph. Data and information are more rudimentary than knowledge, whereas understanding and wisdom are more sophisticated.

A number out of context (data, e.g. 2003) could mean anything: a year, a township address, the byte-size of a file, etc. Once the context is made explicit it becomes information, e.g. Siphon lives at stand number 2003, Slovoville, the answer to 'where does Siphon live?' Knowledge, however, answers 'how' and 'how to' questions, which are more complex. The answer to 'how do I get to Siphon's house?' depends on from where the person asking the question will depart, her/his means of transportation,

etc. Information and knowledge are formally transmitted and taught to people. However, there are limits to teaching; understanding cannot be taught. Each person creates her/his own meaning and by collaborating, the shared unique understanding of individuals produces a cognitive map. It is important to bear in mind that wisdom is often counter-logical, i.e. despite facts and arguments a person just 'knows' at times that something is wrong. Laszlo and Laszlo (2002, p. 405) observe that "the quest for knowledge and understanding is a human enterprise that moves continually toward higher levels of complexity, less clear-cut answers, and more evolutionary possibilities".

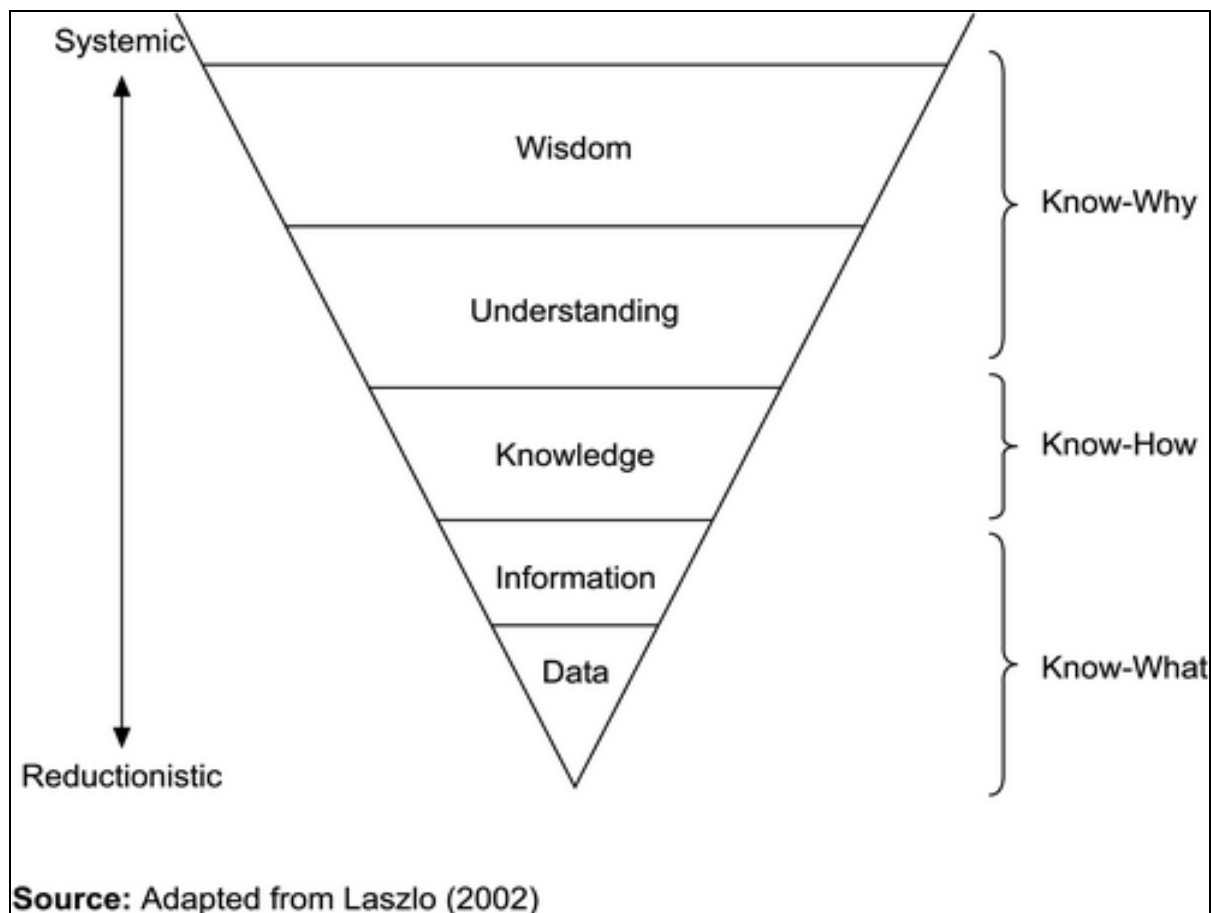


Figure 5: The pyramid of meaning (Laszlo & Laszlo, 2002, p. 405).

Laszlo and Laszlo (2002, p. 408) suggest a third generation of KM (see figure 6). They summarise the first and second generations as follows:

[F]irst generation KM describes "what is" and, by capturing collective intelligence through intellectual capital technologies, promotes best practices. Second generation KM departs from existing knowledge bases in order to suggest "what could be" through processes of learning and innovation.

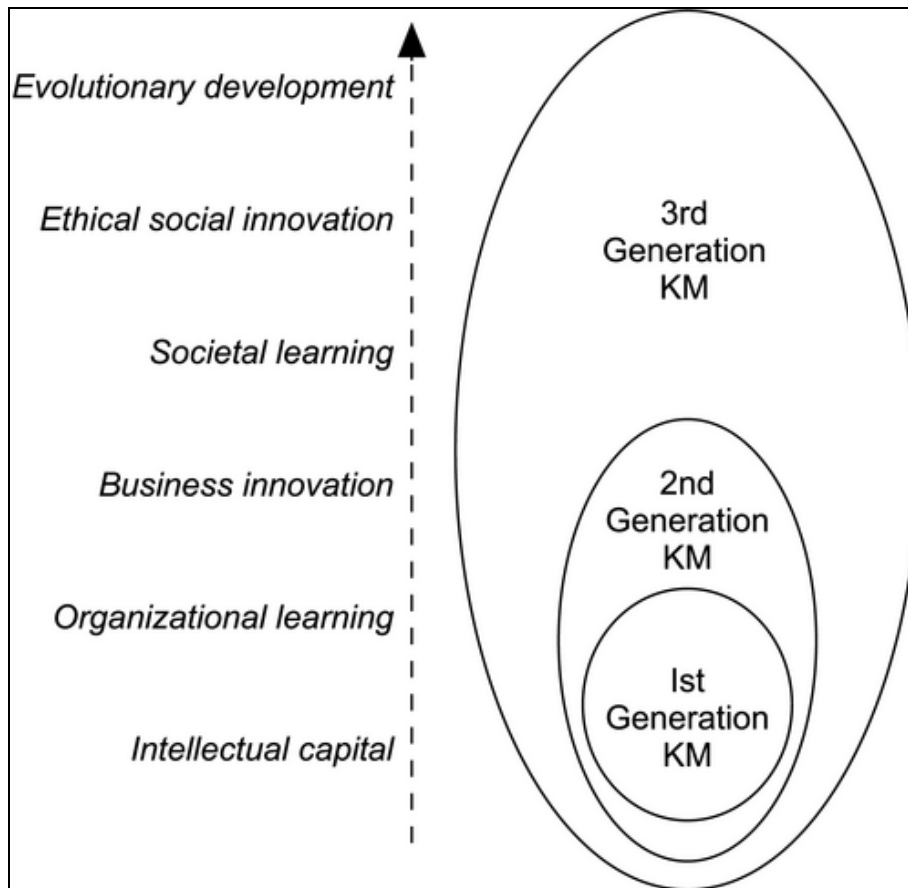


Figure 6: Third generation knowledge management (Laszlo & Laszlo, 2002, p. 408).

According to Laszlo and Laszlo (2002) the **third generation KM** is prospective, an exploration of 'what should be', and a democratisation of knowledge. The third generation moves beyond business applications and presents itself as a provocative invitation to engage in **purposeful and conscious knowledge evolution**. Whereas learning organisations served as a vehicle to second generation KM, evolutionary learning communities empower individuals and groups to partake in the co-creation (third generation KM) of sustainable and evolutionary futures. Third generation KM is about citizen involvement, about the expansion of boundaries, and the bringing about of a learning society, with a focus on meaning and 'know-why'. Third generation KM includes among others a planetary ethic, the development of environmental consciousness, and the observance of human rights and the existing discrepancies between rich and poor.

Conclusion

This paper attempts to illustrate that if an organisation introduces EDMS without doing the required groundwork, EDMS alone would not secure the corporate memory. Managing the knowledge capital of an organisation as strategic intelligence requires a comprehensive organisation intervention.

This includes the simultaneous review of human resource management policies and procedures in order to create a KM culture, which is conducive to knowledge agility.

The paper further outlines the link between knowledge management, the learning organisation and complexity theory. Three generations of knowledge management are further identified. It is suggested that information scientists take cognisance of the bigger context of electronic document management.

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An extract from the report of a document management needs analysis survey.

The percentages reflect the number of survey participants that felt the item on the left is essential, important, nice to have or irrelevant. In addition to the ratings a fair amount of qualitative data (opinions and commentary) were collected, which is contained in the report presented to R&D.Com.

The management of documents

1. Manage all standard types of electronic documents (word processing files, spreadsheets, e-mail, presentations, graphics, etc.)
2. Manage scanned images so that documents not in electronic format can be scanned in, to be available for searching, viewing etc.
3. Manage paper documents, i.e. documents that are not in electronic format and will not be scanned in
4. Capture information about a document (metadata), e.g. author, title, date created, date modified, division, TO/project number
5. Must cater for documents with more than one author
6. The system must distinguish between the typist and the author(s) of a document

Essential 88.9%		Nice to have 11.5%	
Essential 66.7%	Important 22.2%	Nice to have 11.1%	
Essential 30.8%	Important 15.4%	Nice to have 38.5%	Irrelevant 15.4%
Essential 55.6%	Important 22.2%	Nice to have 22.2%	
Essential 44.4%	Important 33.3%		Irrelevant 22.2%
Essential 37.5%	Important 12.5%	Nice to have 12.5%	Irrelevant 37.5%

Collaboration among users

7. Users must be able to share documents with collaborators/co-authors
8. Users must be able to share documents without breaching security (e.g. e-mail is not secure)

Essential 37.5%	Important 37.5%	Nice to have 12.5%	Irrelevant 12.5%
Essential 44.4%	Important 22.2%	Nice to have 33.3%	

The saving of documents

9. Saving documents should be easy and quick
10. The user should specify the directory where a document should be saved (as opposed to the EDMS managing the location of documents)

Essential 100%			
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A few Yes, generally No.
Like to, if needed.

The importation of documents

11. Must be able to import existing documents

Essential 87.5%	Important 12.5%		
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12. Must allow mass importation of documents (so that all the documents on a hard drive/network share can be imported quickly and easily)

Essential 37.5%	Important 37.5%	Nice to have 25%	
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Relationships between documents

13. If a document comprises several individual documents these documents should be grouped together

Essential 77.8%	Important 11.1%	Nice to have 11.1%	
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14. It should be easy to see the relationships between documents, e.g. all documents belonging together should be seen as related (grouped)

Essential 77.8%	Important 22.2%		
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The control of documents

15. The history (audit trail) of each document must be captured (e.g. who accessed, read, edited, printed, e-mailed a document, changed security on a document, etc.)

Essential 33.3%	Important 22.2%	Nice to have 22.2%	Irrelevant 22.2%
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16. Version/revision control of documents, i.e. ensures that it is easy to identify the latest, most current or the approved version of a document.

Essential 55.6%	Important 22.2%		Irrelevant 22.2%
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17. Ensure standardised entering of metadata (e.g. a standard way of indicating a division's name or a client's name)

Essential 66.7%	Important 22.2%		Irrelevant 11.1%
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18. Must prevent unauthorised deletion of documents

Essential 88.9%			Irrelevant 11.1%
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System & document security

19. Access to the EDMS must be controlled to prevent unauthorised access to documents

Essential 100%			
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20. Access to documents must be controlled at document level (to avoid unauthorised access to confidential documents)

Essential 87.5%	Important 12.5%		
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21. Different levels of access to documents can be assigned to groups and/or individual users, e.g. view profile of document only, read the document only, able to change the document, etc.

Essential 75%	Important 25%		
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22. Ability to and set different security, e.g. all may see 'published version' or the final version, but only the author(s) may see 'in progress' or draft versions

Essential 42.9%		Nice to have 57.1%	
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Search functionality

23. Searches must be easy yet powerful

Essential 100%			
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- 24. Must be able to do advanced searches, e.g. wildcards, Boolean, proximity, date, etc.
- 25. Must be able to search on metadata, e.g. author, title, date created, date last edited, research project number, application, etc.
- 26. Must be able to search the contents of documents
- 27. Search results should be ranked according to relevancy to search terms
- 28. Search terms must be highlighted in retrieved documents when a full-text search has been done
- 29. Must be able to save regular searches
- 30. Must be able to print search results

Essential 55.6%	Important 33.3%	Nice to have 11.1%	
Essential 33.3%	Important 44.4%	Nice to have 22.2%	
Essential 40%	Important 50%	Nice to have 10%	
	Important 33.3%	Nice to have 66.7%	
Essential 11.1%		Nice to have 66.7%	Irrelevant 22.2%
	Important 33.3%	Nice to have 55.6%	Irrelevant 11.1%
Essential 12.5%	Important 50%	Nice to have 12.5%	Irrelevant 25%

Integration of the system with applications

- 31. The EDMS must integrate with commonly used applications within R&D.Com
- 32. The user must be able to save documents from within a commonly used application, e.g. MS Word, to the EDMS
- 33. A viewer for quick viewing of documents (use a viewer instead of having to open the document in its application to see the contents)
- 34. A viewer for documents that were created in applications that are not installed on a user's PC (e.g. CorelDraw presentations) or for obsolete formats

Essential 85.7%	Important 14.3%		
Essential 57.1%	Important 28.6%	Nice to have 14.3%	
Essential 11.1%	Important 33.3%	Nice to have 33.3%	Irrelevant 22.2%
	Important 50%	Nice to have 50%	

Archiving of documents

- 35. Must make provision for archiving long-term documents to offline/nearline media according to an approved retention schedule
- 36. Must be able to search archived documents
- 37. Must be able to retrieve archived documents
- 38. Must be able to restore archived documents

Essential 50%	Important 50%		
Essential 55.6%	Important 44.4%		
Essential 44.4%	Important 55.6%		
Essential 50%	Important 37.5%	Nice to have 12.5%	

Other electronic document management system features

- 39. The EDMS should be accessible to all staff members (save and read documents)
- 40. Must allow users to work in off-line mode, i.e. allow users to save documents to a laptop, hard drive, floppy or other media, modify the document and check it back in to the EDMS
- 41. When the network goes down, the user should be able to continue working on a document without losing any modifications

Essential 60%	Important 20%	Nice to have 20%	
Essential 28.6%	Important 71.4%		
Essential 28.6%	Important 42.9%	Nice to have 14.3%	Irrelevant 14.3%

Other

- 42. The system should be flexible enough to cater for changing needs
- 43. Once a document is created, does it need to go to other people for review and approval? If so, how is this achieved at present?
- 44. Are there time frames for reviewing and approval of documentation?
- 45. Do you need to see a history of the path that a document followed and people's comments while the document was being reviewed?

Essential 55.6%	Important 11.1%	Nice to have 33.3%	
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Review done via e-mail. Some make use of Word's 'track changes' and others place the document on the divisional shared directory while in process.

Yes, in a way, but a flexible time frame.

	Important 50%	Nice to have 25%	Irrelevant 25%
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Thomas Groenewald