Knowledge Management: Is IT Delivering?

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After more than a decade of intranets, email and other collaborative technologies David Skyrme argues that many IT solutions still have a long way to go to help knowledge workers be more effective.

You know that things are not quite as they should be when you resort to Google to search for things on your own intranet. Or when you struggle to find an important email that you know you have received. Or when you discover a colleague's blog that is much more informative than the authoritative documents on the corporate portal. Modern knowledge management has been with us for more than ten years, and information technology has played an important part in its evolution. Yet almost every knowledge worker feels on some occasions that it often seems more of a hindrance than a help in their daily work. This article explores the evolution of both KM and IT support for KM over the past decade and asks if we are expecting too much of technology and what can we do to make it work better for us.

The evolving knowledge agenda

Modern knowledge management emerged in the mid-1990s with some high profile conferences, such as Arthur Andersen's *Knowledge for Strategic Advantage* and seminal books such as Nonaka and Takeuchi's *The Knowledge Creating Company.* These highlighted the need to address both explicit and tact knowledge when embarking on KM projects. Unfortunately, too many practitioners, especially in the USA, saw technology (which helps the distribution of explicit knowledge explicit) as the 'silver bullet' rather than an as enabler to help knowledge workers perform better. As we now know, 'human-centred KM' as promulgated by the EU in its Sixth Framework research programme provides a better starting point.

In an in-depth report of international best practice written by myself and colleague Debra Amidon in 1997, we identified two main thrusts of KM initiatives.

The first was that of making better use of the knowledge that already exists within an organization, for example by sharing best practices across departmental and geographic boundaries. This addresses the oft cited lament: "if only we knew what we knew". Hence, in around half of the 30 plus initiatives we studied, installing or improving an Intranet, was a core part of the programme. The second major thrust was that of innovation, the creation of new knowledge and its conversion into valuable products and services. The emphasis here is on an environment where creativity and learning flourishes and knowledge is encapsulated in a form where it can be applied. Thus new knowledge is embedded into products, into improved business processes and into high value services.

Over the last decade we have seen many activities come within the gamut of knowledge management. These include:

- Creation of knowledge databases - best practices, expertise directories, customer profiles, market intelligence etc.
- Information and content management processes – for gathering, filtering, classifying, disseminating and applying information.
- Communities of practice – knowledge networks that cut across departmental boundaries and support knowledge workers in sharing experiences, solving problems and acting as repositories of core corporate knowledge.
- Reuse of knowledge captured by customer call centres, by feeding it back into product support databases, improvements for new products and services.
- Learning events – including After Action Reviews, cross-departmental 'away days', storytelling sessions and 'share fairs'.
- Knowledge harvesting – to capture in a structured way knowledge from experts, or knowledge from those who are leaving.

In fact, any activity that uses and applies knowledge can benefit from the discipline of knowledge management, and that covers most managerial and professional activities. Whether they come under the knowledge management label, depends on the culture and language within a given organization.

As knowledge management has matured we have seen it evolve from a niche activity to mainstream in many organizations. It has spread around the world. South Korea, Malaysia, India and Latin America all have active KM communities, as

readers of *InsideKnowledge* will be aware. It is practiced in almost every business function (Ark Group has a publication specifically for the legal profession) and is a subject on many degree courses (you can get an MKM – Masters in Knowledge Management – from the University of Melbourne, California State University and Copenhagen Business School among others).

We are now at a juncture where the KM community seems as divided as never before on its direction of travel. In an informal survey I conducted among KM leaders and experts, I found three schools of thought. The first group thought that KM was "past its sell-by date". The second that KM "has a long way to go" and the third that "it's future is far from clear". Whether it gets subsumed into a new management fad, continues to thrive as roughly as it is now, or evolves into 'new generation KM' is open to debate. Whatever, the outcome, it seems clear that progress in the modern world is predominantly knowledge-driven, that knowledge is a core driver of many an organization's financial wealth and that today's professional worker needs to expand their specialist knowledge and skills as never before. We therefore, either as individuals, organizations or societies, need to learn how to better manage, expand and exploit this key resource.

Ten topical themes

From the same survey mentioned above, ten core themes emerged as key challenges that must be addressed if KM is to deliver value and be of service to society:

1. Strategic embedding – making KM part of the strategic fabric of the organization, adding value to its outcomes and actively supporting its objectives and plans.
2. KM with everything – applying a knowledge lens to every aspect of an organization's activities; identifying the role of knowledge and demonstrating the KM contribution.
3. Work embedding – an integral, even invisible, part of the daily routine of knowledge workers; achieved through PKM (personal knowledge management) tools, techniques and approaches.
4. Know-who - tools and techniques for identifying and interacting with experts.

5. Tapping tacit knowledge - before it leaves or is lost in the mists of time, ideally through embedding so it is captured naturally during the course of work.

6. Knowledge networking – nurturing and sustaining communities of practice without over-managing them; addressing human, social and cultural factors.

7. Collaborative technologies – using IT to enhance collaboration across the organization through a variety of technologies that help the distribution and sharing of information.

8. Commercialization – recouping some of your investment in KM by packaging knowledge used for internal purposes and selling it externally.

9. Meaningful measures - giving as much attention to measuring knowledge and intellectual capital as is given to physical and financial assets.

10. Governance and ethics - taking responsibility for your knowledge and not misusing it to the detriment of others.

Apart from information and knowledge, the majority of these concern human, cultural and organizational factors rather than technology *per se*. Does this mean that IT is taken for granted or is irrelevant to succeeding with KM? Let's explore.

IT – getting better all the time

Technology continues to improve, generally in a steady rather than spectacular fashion. Here is how it has evolved alongside KM:

■ Email has consistently been the main KM tool that knowledge workers use to communicate, yet most people suffer from 'email overload', even stress.

■ Production of web pages has been streamlined through the introduction of enterprise CMS (content management systems), with built-in workflow processes and publication rules.

■ The portal has emerged as a solution that integrates once different solutions such as document management, CMS, discussion forums and search; there has also been consolidation amongst suppliers.

■ Search has become 'smarter' – you can search by categories and have your results clustered according to concepts, such that similar documents are grouped together.

■ There are growing niches of specialized KM solutions, in areas as diverse as patent analysis visualization (e.g. Aureka and OmniViz), innovation approaches based on TRIZ (e.g. Ideation's TRIZ and Invention Machine's

Goldfire Innovator™) and help-desk decision support software (e.g. KANA's Contact Center and KNOVA's Contact Center™)

■ The range of technologies for social interaction is broadening; to computer forums and videoconferencing that have always been around, are today added wikis, blogs, instant messaging and networking websites (such as Facebook and LinkedIn).

The pattern is one of niche products becoming mainstream, of consolidation as technologies mature and constant innovation bringing yet more options into play.

A consequence of organizations embracing KM is that their knowledge processes become more explicit, more systematized, more cross-organizational and more geographically dispersed. As a consequence they more readily lend themselves to the application of IT. Typical surveys of the role of IT in KM cite email, internet/intranet and search engines as the predominant technologies, with EDRMS (electronic document and records management) catching up fast. Less popular but widespread are discussion forums, videoconferencing and decision support tools. More recent arrivals, that are considered by many as 'grass roots' knowledge management tools, are blogs, wikis and instant messaging.

With such choice, selecting what solutions to use for which activities and which knowledge processes is one of the major challenges facing both organizations and individuals alike.

Different perspectives

What the range of these technologies indicate is the wide variation in how IT might support knowledge work. One perspective to consider is the amount of explicitness and structure in the knowledge that IT supports. Highly structured forms are seen in formal databases with well defined fields and procedures. Semi-structured content is found in categorized documents held in EDRMSs. Unstructured content might be MS Word documents where little attention has been given as to how it is named or where it is stored. While tacit knowledge by its very nature (being in people's heads) is not present in IT systems, its articulation in the form of the written or spoken word is found in email, blogs, audio and video clips and so forth. An important consideration here is how

knowledge evolves from one form to another. When (if ever), for example should emails and MS Word documents be classified and put into an EDRMS?

A second perspective is the relationship between human and machine (Table 1).

	Passive knowledge (explicit, information)	Active knowledge (tacit)
Person to Person	Emails Computer forums Expert networks	Meeting support Video-conferencing
Person to Computer	Document Mgmt Info Retrieval Knowledge bases	Expert Systems Decision Support
Computer-Computer	Text Mining	Neural Networks Intelligent Agents Transactions (XML)

Table 1. Knowledge transfer technologies

Some of the solutions, such as email, are 'push' approaches where information is sent to the user, whether they feel they need it or not. Others represent 'pull' approaches, where the user accesses information just when they need it. The IT solutions can be subservient – doing precisely what the user requests - or adaptive. Adaptive solutions are where the software 'learns' about the users needs and usage patterns and tries to help. We all remember the annoying MS Office 'paper clip' helper, but more intelligent agents, such as Autonomy's Active Knowledge™ will push relevant knowledge to the user by analyzing what they are typing.

Another perspective comes from mapping different IT solutions to the knowledge processes that they enhance. Figure 1 shows a simplified schematic of knowledge processes (similar to a value chain). The left most categories distinguish between the two main thrusts of knowledge management mentioned earlier: 1) identifying

existing knowledge; and 2) creating new knowledge. Naturally some solutions address several knowledge processes.
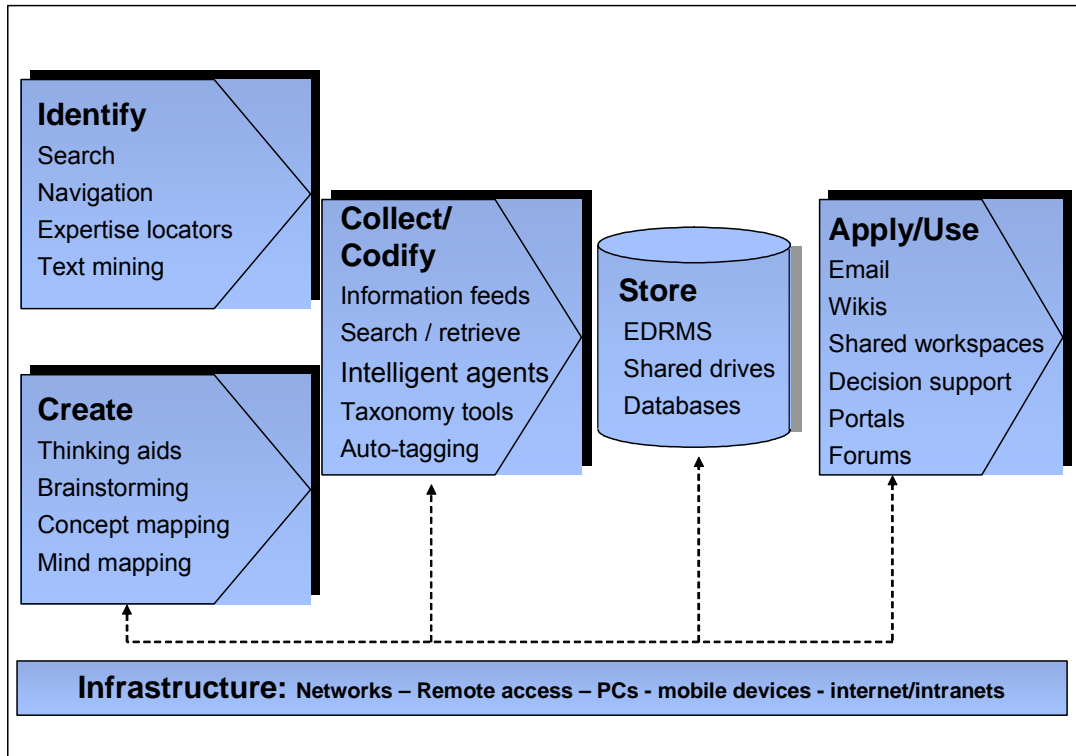
Identify
Search
Navigation
Expertise locators
Text mining

Collect/ Codify
Information feeds
Search / retrieve
Intelligent agents
Taxonomy tools
Auto-tagging

Store
EDRMS
Shared drives
Databases

Apply/Use
Email
Wikis
Shared workspaces
Decision support
Portals
Forums

Create
Thinking aids
Brainstorming
Concept mapping
Mind mapping

Infrastructure: Networks – Remote access – PCs - mobile devices - internet/intranets

Figure 1. Representative IT solutions mapped against knowledge processes.

Our final perspective – and probably the most important - is that of the knowledge worker and the work that they do. Although PKM (personal knowledge management) has featured un these columns from time to time, it has not had the attention it deserves. After all, it's intelligent people – not computers – who should take the lead in directing knowledge work. What we need to take into account are the different types of knowledge work and the different personalities of people who do it.

A commonly used way of categorizing knowledge work is shown in Figure 2. When knowledge is reused in similar situations it can be codified. It could be packaged into an application with given constraints (rule-based work) or into a process, which as well as being an application could be a combination of workflow and access to databases, and forms to create the required outputs. The individual expert generally does not want to be hidebound by a strict application, but needs a set of tools to explore different avenues. Mind-mapping tools, search and

retrieval, document templates, as well as the usual office suite tools constitute the IT solutions that they typically need. However, as we all get more connected, more knowledge work, and particularly high value work, needs collaboration. And this is where we need collaborative IT solutions.
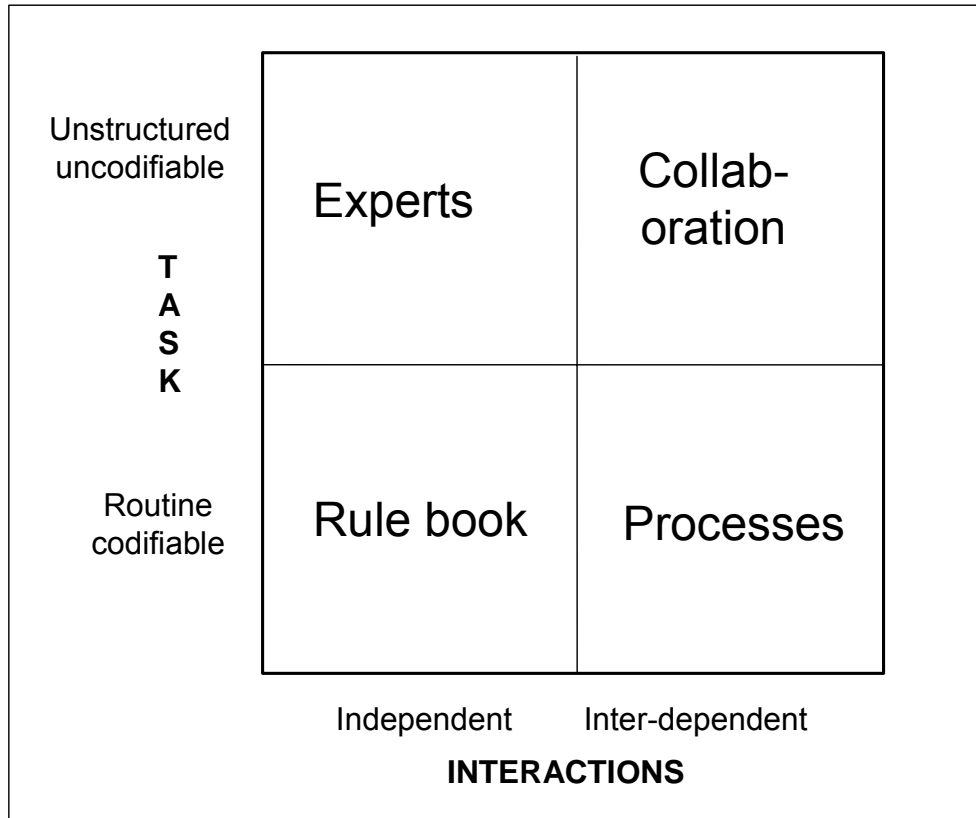
	Independent	Inter-dependent
Unstructured uncodifiable	Experts	Collab-oration
Routine codifiable	Rule book	Processes

Unstructured uncodifiable

T
A
S
K

Routine codifiable

Independent   Inter-dependent
INTERACTIONS

Figure 2. Categories of knowledge work

Collaborative IT solutions

Most of the solutions discussed so far can be used in a collaborative way. Even if an IT product is stand-alone on a user's PC, they can work collaboratively provided each contributor can read and manipulate the content produced by others. Using the 'track changes' and comments in MS Word is a good example of this style of collaboration. More tightly bound collaborative products include collaborative workspaces, where document libraries, forums, task and diary scheduling can be worked on simultaneously by multiple users, albeit with record or document locking whilst edits are taking place. Eroom, now part of EMC's Documentum family is an example of this. An intermediate approach is provided by P2P (peer-to-peer) products like Groove (now owned by Microsoft) in which only changes to shared documents are transferred over a network.

If IT is to fully support collaborative knowledge on then it must work for all these types. What is needed is a robust IT collaborative infrastructure and set of tools and applications, such as depicted in the 6-layer model shown in Figure 3.
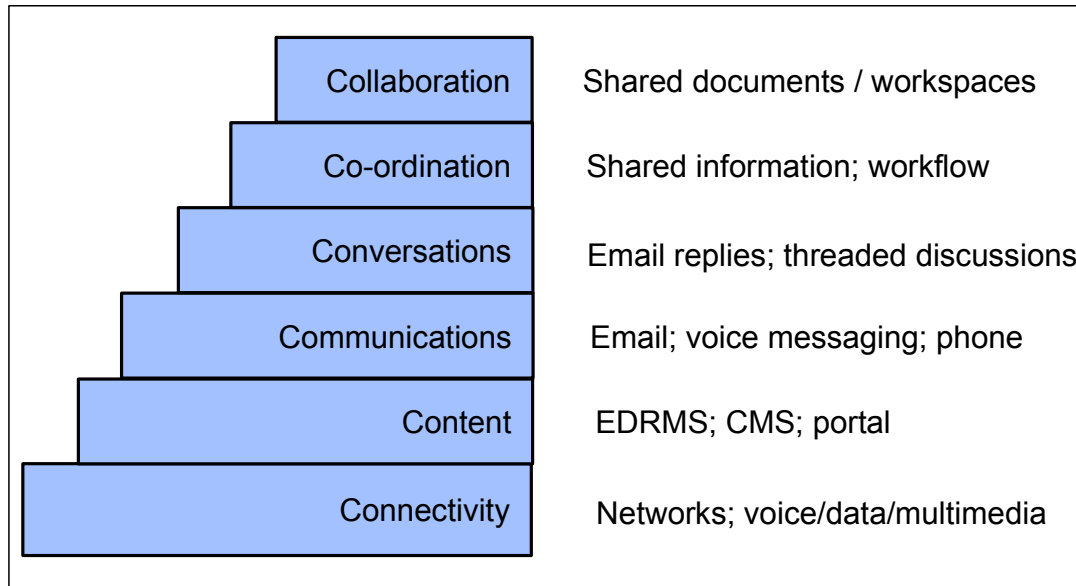
Collaboration	Shared documents / workspaces
Co-ordination	Shared information; workflow
Conversations	Email replies; threaded discussions
Communications	Email; voice messaging; phone
Content	EDRMS; CMS; portal
Connectivity	Networks; voice/data/multimedia

Figure 3. An IT collaborative infrastructure

At the base level is the requirement that people should be able to connect into knowledge whenever and wherever they are (in the office, at remote sites, on the move etc.). At higher levels, there must be mechanisms for communicating effectively, sharing content, and rich functions for close collaboration. Each layer builds on and depends on the one below. But even when all this technology is in place, it still often falls short of users' needs. Why is this?

So why doesn't IT deliver?

The simple reason is lack of a holistic approach to KM. As noted earlier, many KM challenges relate to people, processes and structures. As you move up through each layer of the above model, more of the challenges are people and organization, rather than technology, related. There needs to be cohesiveness across not just up and down the technical infrastructure but across a comprehensive KM architecture. Table 2 shows a simplified architecture that draws these aspects together in a cohesive way. This is an extract from the author's 3-dimensional architecture that has five columns rather the two dimensions and three columns here.

	Knowledge and processes	People	Technology
Collaboration	Communities of practice Validation	Culture Motivation Trust	Collaboration tools Project / team workspaces
Coordination	Dependency maps Project management Procedures	Liaison roles Knowledge 'brokers'	Workflow Shared documents Scheduling
Conversations	Protocols Dialogue structure Refining 'nuggets'	Listening and communications skills Advanced skills (e.g. Storytelling)	Threaded discussion forums Search / retrieval
Communications	Records and regulatory (what to keep)	Basic communications skills (e.g. Selection of media)	Data / voice Messaging / email
Content	Structure and organisation (taxonomy) Standards	Roles and responsibilities (e.g. Owners, reviewers, custodians)	CMS EDRMS Web pages
Connections	Knowledge maps (including people)	Expertise directories	Network infrastructure

Table 2. Extract from a holistic KM architecture

Typical of the symptoms of breakdown in cohesiveness are those mentioned at the start of this article. Although it takes a lot of effort to make everything seamless, there are some common quick wins in most situations and some prevailing challenges. Amongst the quick wins:

- Improving email effectiveness – developing an email charter of good practice, headings that relate to content, avoidance of copying all and sundry, putting different topics in different emails, minimizing attachments (using hyperlinks instead) etc.

- Adding contextual information to content – who is the audience for this information? What is it used for? What factors need to be considered when using it? How good is it (e.g. based on actively encouraged feedback)?

- Qualifying and updating information - giving details of originator, revision date, expiry date (how much of your portal has content beyond its 'sell by' date?).

- Enriching content with multimedia e.g. adding video clips or voice to databases of best practice or problem solution databases.

- Allowing comments and annotation – provision for users to add personal notes to individual content items (this is a standard module in most open source content management systems).

- Providing links to experts – making it easy to move from a passive document contact the author or an expert on that topic through a simple mouse click, perhaps even autodialing the expert.

These all help enrich raw content by adding a more human dimension. These improvements will not happen overnight but it is important to get the disciplines and information standards in place as a foundation to build on.

There remain, however, some significant challenges, which typically represent competing pulls or philosophies. Here are a few:

- The 'one size fits all' syndrome - examination of Figure 2 indicates that different types of work added to different user preferences requires highly flexible systems; yet IT support groups benefit from the efficiency of standardization.

- Human vs. auto-classification - how much should authors structure and classify their content and how much should be left to technology, either at the tagging stage before publishing it or inferring concepts and structure later.

- Pace of migration – using the latest and best vs. the well established and trouble-free. People like familiarity. Anyone who has used Office 2007 will

start (like me) by struggling to find even basic functions, such as "File Save As". Any change or new system requires adequate re-skilling, a basic fact that is too often given inadequate attention.

■ The shared-drive syndrome – for too long in the early days of KM much good information was "hidden on the C: drive" of a personal computer; today many organizations have systems of folders on shared network drives. How easy is it for people to find what they want on these drives and at what point does this content warrant moving to an EDRMS or intranet?

Above all, although much lip service is played to user involvement in the development of IT solutions, too often users only become involved once the system is almost ready to launch. It's not all the IT department's fault since users are often unsure of what they want or are busy on their 'day job'.

The answer

So does IT deliver? Knowledge management initiatives depend on good IT. In general, good products are available. Product shortcomings are usually concerned with inadequate interoperability (e.g. adherence to standards), scalability, flexibility and usability (even after years of knowledge about what makes a good human-computer interface!). Also, too many products still lack the necessary degree of customization to make them totally 'fit for purpose'.

Where IT does not deliver it is usually because insufficient attention has been given to the non-technical factors such as human factors, organizational processes and culture, content management processes and content standards. Above all it is about putting the knowledge worker at the forefront of IT (remember the mantra "customer-focused"?). In turn the knowledge worker has to hone his or her skills, not just on the IT products they use, but in the skills of managing information, communicating effectively, participating in communities and engaging in meaningful collaboration. Only then will IT truly deliver.

In summary, it's all about putting the I back into IT!

About the Author

David Skyrme is a semi-retired KM consultant. He has written and presented extensively on the subject and has advised on many KM initiatives across the world. His website is a heavily used source of guidance for practitioners.

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