

The Seven Ages of Information & Knowledge Management: What Have We (Not) Learned?



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In 2004 an analysis of the state of the discipline of KM identified five eras of its evolution. This article is based on a presentation given in 2013 on the 21st anniversary of NetIKX, a network of information and knowledge managers. The passing of time and the broadening of scope beyond KM into IKM has resulted in the extension of the former five eras into seven. The article also analyses what we have learned in previous eras and whether or not we have taken those lessons forward.

Introduction

Throughout its evolution there have been many and varied definitions of knowledge management. Here is a working definition that I have used since the mid-1990s:

Knowledge Management is the explicit and systematic management of vital knowledge - and its associated processes of creation, organization, diffusion, use and exploitation.

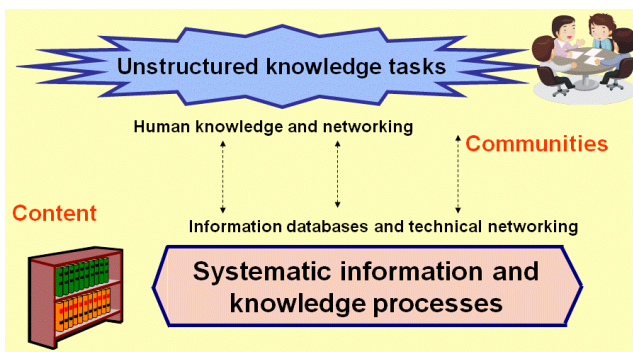
- explicit: knowledge is explicitly recognized (language, documents etc.)
- systematic: it is too important to be left to chance
- vital: the need to be selective; there's lots of knowledge floating around so it's important to focus on that which is important
- processes: the complete life cycle of knowledge from creation, through structuring, re-use and ultimately to its archiving or loss.

Seven Ages

The notion of seven ages was popularised by William Shakespeare in As You Like It. Just as humans go through a life cycle, so do management disciplines. We use different terms but many of the characteristics in the early stages are surprisingly similar. Here are the terms that were used in the five eras of KM¹:

- BC-1995AD: Pre-dawn of realization
- 1995-7: Awakening / emergence
- 1997-8: Bandwagon / relabeling
- 1998-2002: Segmentation / Consolidation
- 2003- : In search of a new identity.

The update of this explicitly recognizes the establishment of IRM as a discipline and also adds two new emergent eras, that of social IKM and that of 'big data'.



- BC-1970s : Pre-dawn of Realization
1970s - 1992 Establishment of IRM ←
- 1995-1997: Awakening / Emergence
- 1997-1998: Bandwagon / Relabelling
- 1998-2002: Segmentation / Consolidation
- 2003-2005: Re-evaluation / Redefinition
2005 - IKM2.0 and DIKM ←

The essence of knowledge management draws together two threads - managing explicit knowledge (in documents and databases) and managing tacit knowledge. The former refers to information in its many guises (content) for which there is a body of discipline in the information management community, and here we are referring to information managers typically from a library rather than information technology background. The second strand is the creation of an environment and practices that enable people to share what's in their heads (community). Taken together this provides the context for the rest of this article and henceforth we to our approach as IKM (information and knowledge management).

As a result our seven ages now start in the 1970s. We now go through them in turn, combining a human life cycle label with that of an IKM label. But first we must look back at the dawn of civilization.

Pre-dawn of realization

The human race has engaged in knowledge sharing ever since they could communicate. Stone Age men showed their youngsters how to hunt. Nothing was written down

¹ Knowledge Management: Where Now? Where Next? David J Skyrme, presentation to Aslib KIMnet, July 2004. (accessible at www.skyrme.com/kmpresentations/)

but the knowledge was transferred by what today we would call the 'apprenticeship model'. Similarly, knowledge was managed and shared in organizations ever since we evolved modern management methods. Just because something doesn't have a label, doesn't mean that we don't do it. We may have done it subconsciously. Even if a practice has been explicitly recognized, something that today falls under the IKM umbrella term may have been referred to differently. 'Sharing best practice' and 'quality circles' are two obvious examples.

Era 1: Infancy - The establishment of IRM.

This era spans the period 1970s - 1992. Although the scope of librarianship had increased throughout the 20th century, the proliferation of computers into mainstream organization functions led to a growth in interest in managing the data and information that they processed. One of the pioneers of what we now call IRM (Information Resources Management) was Tom Wilson who started an Information Studies course at Sheffield University in 2003. He outlines the development of the discipline in a 2002 article.²

He cites that the first use of the term IRM occurred in the report of the *US National Commission on Federal Paperwork* (1977). It became more widespread after the publication by the Association for Systems Management in 1979 of 'Woody' Horton's book *Information Resources Management*. This book went into some detail of how to record and manage information in an organization. It was a workshop in London by Horton that inspired a group of people to form an IRM Network special interest group in 1992 under the auspices of Aslib, one of the UK's professional societies for librarians. Over time the Aslib IRM network morphed into KIMnet (Knowledge and Information Management network) and more recently as NetIKX (the Network for Information and Knowledge Exchange) now a "fully independent community of interest" whose focus is on the practical issues of managing knowledge and information in the workplace.³

Era 2: Childhood - The emergence of KM

Although management writers like Peter Drucker had written about 'knowledge workers' in the 1960s, attention to what we now call KM really only started around 1995. Two seminal moments happened in this year. They were the publication of *The Knowledge Creating Business* by Nonaka and Takeuchi and the holding of a seminar aimed at business leaders in Houston called *Knowledge for Strategic Advantage*. This was co-sponsored by management consultants Arthur Anderson and also APQC (American Productivity and Quality Center) who are still very active in monitoring development in KM today.

² *Information Management*, Tom Wilson. Accessible at http://www.informationr.net/tdw/publ/papers/encyclopedia_entry.html

³ www.netikx.org.uk

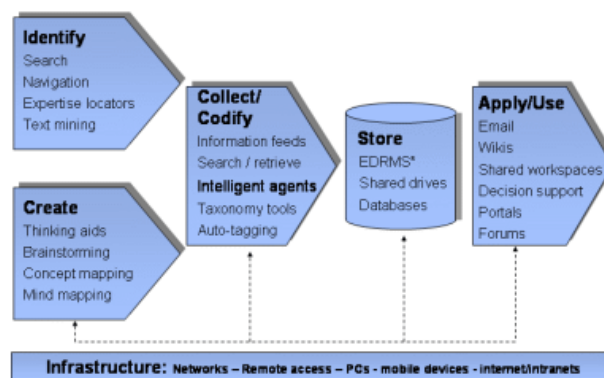
As a result KM became something of a management 'fad', and like all new fads it spawned conferences, publications (at least three magazines had knowledge management in their title) and over the next few years several highly regarded books.

KM took off as a focussed activity in several knowledge intensive industries, such as hi tech (e.g. Siemens), oil and gas (e.g. BP), speciality chemicals (Buckman Laboratories), pharmaceuticals (e.g. Hoffmann La Roche) and all the 'Big 5' management consultancies (PriceWaterhouse et. al.).

Childhood is said to be "a period of experimentation" and this was certainly true of KM.

Era 3: Adolescence - Bandwagon and relabeling.

Throughout the late 1990s the KM bandwagon was gaining momentum. The height of this was the period 1997-8. During this time many companies who were doing KM in some form or other often brought these initiatives under the KM umbrella. Most noticeable however, were that software companies who were involved in a range of offerings to do with records, document management or enterprise intranet software were relabeling their products "KM solutions". There were also several new ventures that entered the fray, few of whom survive today. The diagram below shows some of the IT software involved at different phases of the IKM life cycle.



Another facet of this growth was that often KM was hijacked by the IT or IS department. Several times in my own work I met with KM teams and asked "do you have a librarian" on your team and received quizzical looks. Fortunately most of them had realized the importance of getting a senior business manager on board.

There was also the creation in many companies of a post called 'Chief Knowledge Officer' to parallel that of 'Chief Information Officer'. Other knowledge-related titles were also created, e.g. Vice President of Intellectual Capital.

Adolescence is a period of "growing up but can be rebellious". So KM was on a roll, with the enthusiasm of youth, but did it deliver?

Era 4: Adulthood - Segmentation and consolidation

Throughout this period (1998-2002) IKM expanded in several directions:

- into more industries such as construction, engineering, legal and finance;
- into more business functions: this was a period of IKM with everything, e.g. IKM and marketing, IKM and risk management, IKM and innovation;
- into more sectors: notably the public sector started to embrace IKM as well as charities and NGOs; some, such as the World Bank were already exemplars of best practice;
- into more geographies: previously formal IKM programmes were mostly found in North America and northern Europe, but Asian initiatives (e.g. in India, Malaysia, Singapore) started to be noticed. Indeed several key channels for the propagation of IKM knowledge today are based in these countries.

And all the time the discipline was becoming more professional with a bevy of new university courses and even some organizations offering 'KM standards' (though these have yet to become widespread). Organizations too were taking IKM into more nooks and crannies and doing it to a deeper level.

This period also saw increased formalization of IKM methods, such as conducting information and knowledge audits, benchmarking IKM practices, sharing best practice etc. In addition some of the more specialised techniques were being more widely experimented with, such as storytelling.

Towards the end of this period, though, we saw some of the pioneering KM teams being disbanded. Sometimes it was felt that IKM was sufficiently embedded into day-to-day practice, but in other cases, it was the result of cost cutting of a function that could not easily demonstrate its contribution to the bottom line.

Adulthood is "a period of self-sufficiency and responsibility" and IKM was maturing well.

Era 5: Middle Age - Re-evaluation and re-definition

In the period 2003-5 there was increasing questioning about the value of IKM, its future direction and how it fitted into the wider business. In some organizations IKM became more embedded and central functions were decentralized into business units. In other cases, some of the pioneering KM teams were disbanded irrespective of how well the overall uptake of IKM.

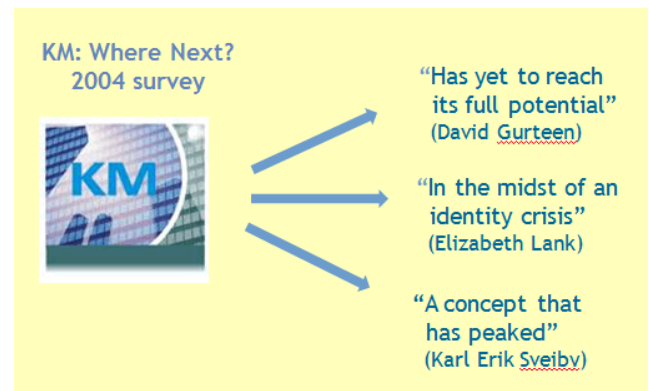
A survey of KM experts that I carried out during this period showed a lot of ambivalence. The responses from the experts fell into three broad groups of roughly the same size:

- KM has only scratched the surface to date; it has a long way to go and has great future potential: "there is

a refreshing realism and business-like approach to KM in many organizations" (Ben Fouche)

- It's not clear where KM is going next: "somewhat confused, disconnected directions, not integrated into business strategy" (Karl Wiig)
- KM is past its 'sell by' date: "We tried KM and it didn't work" (Verna Allee)

Some other responses are shown below.



But irrespective of how experts viewed the future prospects, technology - as in as in all the eras - continued to improve. Intranets were boosted by Enterprise Content Management (ECM) systems and Electronic Document and Records Management Systems (EDRMS). Such systems had the advantage that professionals throughout the organization could make content and documents accessible throughout the organization without themselves having to know how to 'code' in the web markup language HTML. As well as heavyweight systems from established vendors (such as Documentum, Autonomy and OpenText) Microsoft's SharePoint had arrived, though it would be a few more years before it became more widely used.

Many such systems needed the attention of librarians or specialists to 'tag' documents according to some enterprise-wide taxonomy. There was, as there is now, a struggle to balance the extra effort needed to structure folders and tag documents manually as opposed to having smart search software that also recognized categories automatically.

So although broader IM initiative may have lost some of their youthful vigour, the discipline continued to evolve steadily. As with the human lifecycle middle age shows a high degree of maturity but with some loss of momentum and flexibility. It is also a time to reflect on the past and to think about what lies ahead.

Era 6: Old Age - Social and Emotional IKM

Depending on what you think the future is for IKM this might be where the human analogy starts to break down. Nevertheless the period 2005-12 has seen a remarkable shift in the focus of IKM. Although the human element has always been an important factor in effective IKM, the growth of social media has created the era of IKM 2.0, fuelled by the growth in social media. This has resulted in

what some call "grass roots KM". No longer do individuals have to submit content through formal processes or IT departments, but can publish it easily themselves. Moreover, they can carry out two-way 'conversations'.

Of course, discussion groups and forums were already well established as valuable IKM tools in organizations, for example in Communities of Practice. But the expansion of social media into everyday life and on smaller devices has accelerated uptake. Each type of social media has found itself useful for sharing developing and knowledge. Here are a few examples:

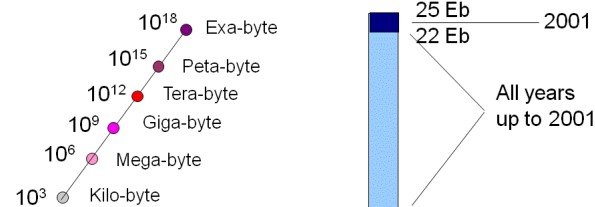
- Blogs - companies have found them an effective way for senior managers to keep employees informed. At Shell they are seen as "an extension to a researcher's lab notebook".
- Wikis - these are a great project management tool. Evolving project or product documentation can be shared in a structured way and it is easy for people to correct and contribute. At the BBC wikis are used when developing policies or procedure manuals.
- Facebook - while there is little use of Facebook *per se* for internal use (it's a great outgoing marketing tool or as in the case of Devon County Council a medium through which they consult their stakeholders), some organizations have developed Facebook-like 'expertise finder' systems that help individuals to connect to experts. One example is BAT Connect at British American Tobacco.
- Twitter - another tool where experts and influencers can be followed to tap into their knowledge. You can't get much into the 160 character knowledge bytes allowed but you can give readers links to more in-depth material. More commonly companies like Starbucks use it to gather customer knowledge from soliciting customer input through specific # (hashtag) campaigns.
- LinkedIn - a professional business networking tool. Many companies now have a strong LinkedIn presence and their employees participate widely in relevant discussion groups. HP, for example, has a group specifically aimed at small businesses that encourages two-way dialogue.

While the main use of many of these tools is for marketing, allowing consumers and customers to follow them, they do provide an organization with an interface to the outside world, and thus can be used as a two-way medium to exchange knowledge with customers, suppliers and other stakeholders. Another point to remember about all these is that there is often little moderation. Therefore the knowledge is not validated, except in the sense that there are individuals whose knowledge you trust above others.

In the human life cycle old age is when people are mostly independent (children off their hands); they often hold strong opinions (and we see this on social media!). But also many seek a simpler life - if only this was true of IKM!

Era 7: Very Old Age - Big Data and Analytics

Today we are generating information at a prodigious rate. Sources such as Eric Schmidt of Google has said that we generate 5 exabytes (5×10^{18}) every day, as much as we did in the whole time up to 2003. However, analysts dispute his assertion.⁴ A slide I used in 2003 used data from the University of Berkley, which reckoned we added 3 exabytes every year.



Do we have a problem?

Document management company EMC estimated 1.8 zettabytes (10^{21} and off the top of my 2003 scale!) were created in 2011 and doubling every two years. That's nearly 5 exabytes a day, though IBM put the 2012 figure more modestly at 2.5 exabytes a day and doubling every 3 years. Whatever the figure we are generating a lot since we capture data from many devices, including in the future edible radio frequency tags on food items. The key challenge is to turn this mass of raw data into useful information and ultimately knowledge.

Again we throw more technology at the problem. We now use analytics with massive computer resources to generate business intelligence. Sometimes, such analysis generates counter-intuitive results. But like other things we already know, do we act appropriately on this knowledge if it's not what we believe? Stan Gibson of IDG argues that you need "hunch before you crunch", citing an example of the hunch of financial fraud which crunching the numbers then confirmed.⁵

So ultimately, although technology can be a useful tool to give us insights, it is the human approach that is needed to turn knowledge into action. Perhaps we are entering the era where IKM means Influence and Knowledge Management rather than simply Information and Knowledge Management!

Going back one last time to our human analogy, very old age is when we are dependent and cannot cope by ourselves. So perhaps the analogy works again. As business managers we cannot do without technology, or indeed our social networks, but we must maintain some of the perspective we had in Era 6 - independence.

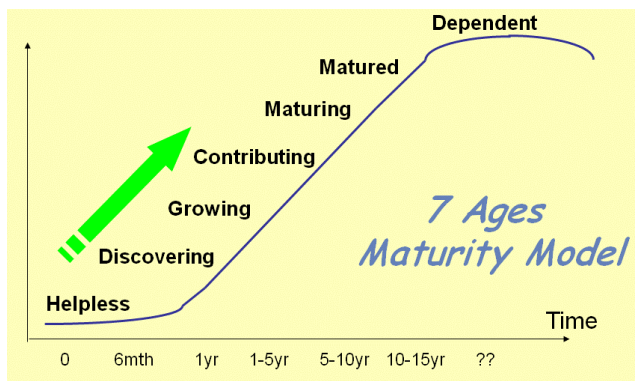
⁴ 'Was Eric Schmidt Wrong?' Klint Finley. Accessible at readwrite.com/2011/02/07/are-we-really-creating-as-much
⁵ 'Crunch your hunch. Intuition is critical for big data analytics', Stan Gibson. Accessible at <http://www.big-dataforum.com/104/crunch-your-hunch-intuition-critical-big-data-analytics>

Seven Ages of IKM in Organizations

Having discussed the 7 ages of IKM as a discipline we now turn to the 7 ages within a single organization. Here we are considering maturity curves. Many models of maturity exist. Some of the better known ones are:⁶

- Infosys - one of several based on the Carnegie Mellon Maturity Model for software. The maturity levels are Default - Reactive - Aware - Convinced- Sharing
- KPMG - a 2002 survey showed only 11% of organizations at the top two levels in their mode: Chaotic - Aware - Enabled - Managed - Knowledge-centric
- APQC - renowned for its KM benchmarking: Initiated - Developed - Standardized - Optimized - Innovative.

Using the human 7 ages analogy I propose one based on human development terminology. The timescales are compressed from human timescales and are indicative of what might be found in organizations. However, treat any such generalities with caution since timescales vary tremendously.



Let's now consider each phase in turn.

Phase 1: Helpless

At this starting out phase, it's usually a case of "we were doing IKM anyway but we didn't know what we were doing." It is this lack of awareness that means that good practice may happen but not in any co-ordinated way. Typically an enthusiast realizes that if the business gives more attention to IKM it can improve its performance. The end of this phase is usually the formulation of an IKM initiative and/or the appointment of an enterprise-wide information and knowledge officer.

Phase 2: Discovering

During this phase, those given responsibility for a corporate-wide look at IKM need to understand where the organization stands now. It is a period of conducting

assessment and audits - assessment of the state of IKM practice, and audits of what information and knowledge the organization needs and how well those needs are met.

One particular facet of this phase is that most organizations discover those pockets of good practice, not just in IKM but in specific business processes. An early initiative is often the replication of best practices into other parts of the organization.

Phase 3: Growing

This is the period in which good IKM practice is spread across the organization. In a large organization key individuals in different departments will be given IKM responsibilities and a network set up for them to share experience or undertake IKM activities on behalf of the rest of the organization. It is often a period when external skills are brought in and small central core team created.

Phase 4: Contributing

In this phase, the focus of IKM is how it adds value to the business, whether this is lowering costs, increasing revenues or minimizing risk. This is also the phase where IKM measurement becomes more formalized. These are not just metrics of IKM performance but identification of the contribution of IKM to better organizational performance.

Phase 5: Maturing

Here IKM increasingly becomes part and parcel of every day organizational life. Over time it becomes more integrated into every task and business process, although the rate of maturing will vary from department to department.

Phase 6: Matured

IKM is now fully matured to such an extent that it is integrated into the work of every department. Wherever you go in an organization, IKM is valued and its contribution to the organization's and department's objectives well understood, measured and managed.

Phase 7: Dependent

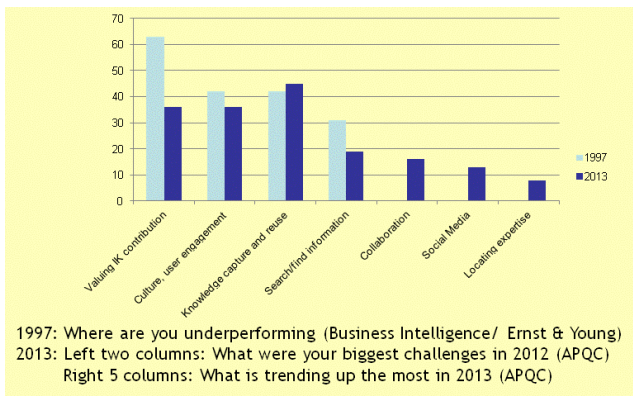
As several commentators have said: "the true success of IKM is when it disappears". It is often not considered something distinct and a central IKM team may no longer exist. Herein lays a danger. It is that the discipline and good practices of IKM may fall by the wayside. Organizations may start to forget what they knew about IKM. I have seen several organizations that were once leaders in IKM fall into bad habits and fail to manage effectively their knowledge for the benefit of the business. The way ahead may take one of two paths:

- Deceased - IKM dies, at least for while, and perhaps until there is an organizational crisis when it is....
- Reincarnated - IKM takes on a new lease of life and is reinvigorated.

⁶ A good review can be found in 'A Model of Organizational KM Maturity based on People, Process and Technology', L.G.Lee and A Kankanhalli, *Journal of Information and Knowledge Management*, Vol 8, No. 2 (June 2009).

What Have We Learned?

From the early days of KM I have maintained that knowledge management and the learning organization are two sides of the same coin. As you apply KM you learn new knowledge, and as you learn your knowledge assets increase. All good KM programmes - indeed all good managers - reflect on the outcomes of their actions, draw lessons and adjust. As I reflect on 20 years of KM one thing that strikes me is that the challenges facing knowledge managers in 2015 are in many ways similar to those of a decade and more ago, as indicated in the results of these surveys:



Thus, valuing the KM contribution, developing a knowledge enabling culture, reusing knowledge and finding existing knowledge efficiently feature highest on surveys in both 1997 and 2012-3. The new kid on the block is social media - "grass roots KM".

So there are some new technologies and a few new methods but the essence of KM and its challenges has changed little since it became more formalized in the late 1990s. Yet, like many established management methods, there is always the allure of the new. In our quest for being innovative, we tend to throw the baby out with the bathwater, i.e. preferring something snazzy and new rather than valuing something old yet proven. Some examples I have witnessed in recent years:

- Unthinking downsizing - getting rid of middle senior managers without recognizing the knowledge that walks out of the door, and more specifically...
- Dismantling KM centres of expertise and hoping that individual business units have the knowledge and skills to manage their knowledge effectively
- Repeating past mistakes by ignoring reviews and lessons learned in similar projects on previous occasions
- Focusing on financial numbers, rather than truly understanding what adds value to the business.
- Thinking of technology as a 'silver bullet' that will address the problem, and ignoring the human factor.

So the key thing I think we have learned is that knowledge of good IKM practice exists, and is extensive, but that it is often forgotten, lost or not fully utilized, to the detriment of organizational performance.

Whatever we have learned about IKM, it is of dubious value if we do not put it into practice. Too often, it's seen as a nice to have add-on rather than an integral part of everyday business practice.

The key thing I think we have not learned is the best way in any given organization to truly value the contribution of knowledge and IKM.

So for those tasked with improving an organization's IKM performance, and ultimately business outcomes, the key question that you as an information and knowledge manager should ask is:

"Why am I doing IKM anyway?"

You must continually review your outcomes and show how IKM adds value to the 'bottom line' to demonstrate its and your worth.

Final Thought

The presentation on which this article is based was delivered on the 21st anniversary of the founding of NetIKX, so I left delegates with this thought:

"When you are 21 you are halfway to 42."

and we know that 42 is:

"The ultimate answer to the meaning of life, the universe and everything, including IKM"

(with acknowledgement to Douglas Adams).