

KNOWLEDGE MANAGEMENT AT EDF

TEN YEARS ON

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The current fashion in knowledge management is evidence of a growing collective awareness: intellectual capital is a key point to adding value both economically and to a company itself. The question now is whether companies and institutions are going to be able to find the organisational and human innovation which will allow the «knowledge virus» to spread into all company procedures. Can one expect to see a second generation of knowledge management, and what form will it take? Taking the French utility EDF (Electricity of France) as an example, let us describe the transformation taking place in the knowledge management approach.

The Pioneering Phase

At the beginning of the 90s the first knowledge management projects appeared in industrial organisations. Various different companies in France and the rest of the world, and in particular EDF, took part in the movement which seems to mark the first generation of knowledge management;

What brought about and what were the main features of this phenomenon, so widely propagated in the economic press? Was it really new? A retrospective glance shows that in many respects companies have always captured and shared their knowledge, in structures, processes, products and documentation.

However, for the most part, business procedures didn't focus on knowledge but rather on more palpable notions to do with products, services and the customer. Knowledge was active as a process but less obviously visible, that is to say more subconscious.

This is the context in which the first knowledge management projects took place. At EDF for example, those in charge of the Electrical Equipment Department noticed a number of cases of malfunctioning liable to perturb production and innovation processes. This

malfunctioning was linked to two intangible elements; information and competence.

At the outset of the 90s computer tools and norms formed a very different landscape to the one we see now, ten years on: the web, collaborative work tools, portals, and other communication software networks didn't yet exist and Internet was far from being focused on by IT (Information Technology) Management staff. Documents linked to everyday activities were transferred in print from the sender to a limited number of people and as soon as they were out of date, stored in archives or centralised documentation systems, not easily accessible being removed from the production field. That is why the most natural and current system for capturing knowledge, in most professions, was the office cupboard, a very individualistic system if ever there was one.

So far as skills management is concerned, the situation was hardly any better. Human resources management also remained a centralised affair, very far from the reality of on hand know-how because models used to characterise skill competence were usually based on very abstract and general principles. While as for on-going training, it was a rather slow functioning regulator for acquiring new skills, although undeniably useful. These various processes proved insufficient for dealing with the human consequences of economic pressure: the destructive reorganisation of professional skills, staff turn-over, experts leaving the company, the newly recruited taking too long to acquire professionalism, weak collective learning and capacity for innovating, etc.

The First Generation

With the Diadème approach at EDF, the Electrical Equipment Department set up a system whereby each engineer become a « knowledge contributor », gradually enhancing the widely accessible «Business Knowledge base» over the course of time. This took the form of a portal which, to coin a very current term, aggregated collections of documents, Internet or Intranet sites and active users' files permitting one to find out who knew what and all kinds of other information potentially useful for the job. Here is an example of how it works: an engineer is questioned by a customer about the phenomena of over-voltage in transformers when jolted during transmission or stuck by lightning. By browsing into the knowledge base they are immediately able to follow up leads: and discover they

can question Mr. Alain X, expert on the subject; They may also discover that the phenomena of «ferroresonance» can occur in similar conditions and are able to download the relevant studies in a few seconds.

For such a knowledge base to be pertinent and efficient it is essential for contributors to be motivated enough to want to share information with others, they also have to learn to be selective (otherwise the knowledge base would fast become a collective dustbin!). Finally, it's essential to cultivate curiosity and open mindedness for the process of managing knowledge to become a professional value commodity: it isn't a question of developing a collective archive but rather a source of knowledge endeavouring to be alive, evolving, transversal and open to the outside world. All these conditions are known to be the necessary ingredients for success and knowledge managers know how difficult they are to assemble. One needs to be patient, methodical and to have the support of the majority and, of course, constant top down backing .

One point in common with other knowledge management approaches, beyond their obvious differences, is to be found in the fact that knowledge is considered «to exist», or put in another way, it is considered implicitly as an object.

Therefore the common concept of first generation knowledge management manifests a mechanistic, instrumentalist or at best behaviourist epistemology. In this approach, knowledge, captured in a knowledge base, is then meant to be ready-to-use (by a «drag and drop» process), in the same way as many kinds of material products. This could be called the «behaviourist» error, the same problem being found in human communication. The behaviourist approach describes communication as a top down process, in which a message is distributed in a one-way flow and neither allows the receiver to react nor learn. We know this model to be totally wrong, but it persists in many communication systems today.

The Next Generation

Palo Alto proposed a more sophisticated model, inspired by cybernetics, in which the user is able to react and learn. This is the concept of feed-back and is relevant to understanding knowledge

management. Three main processes need to be considered: Capture, Transfer, and Renewal.

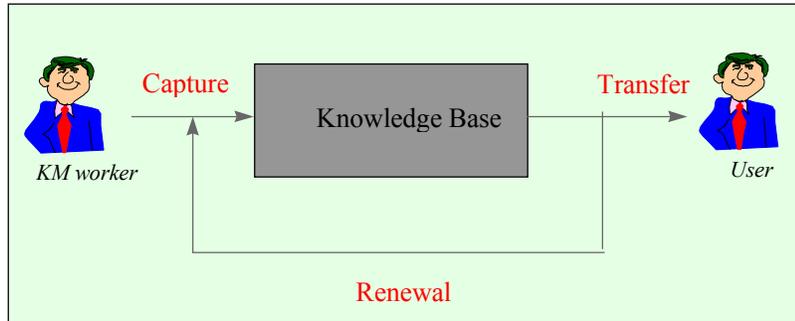


Figure 1 : The CTR model for knowledge management

Capture : is a series of processes by which information and knowledge are identified, codified, indexed, classified, aggregated and discussed so as to enhance the organisation's knowledge base.

Transfer : refers to the processes by which information and knowledge are distributed, used, and then, transposed and integrated through a learning process by the user. In this concept the user is not passive but on the contrary able to incorporate, transform and apply the accessible knowledge. This means having the special ability to turn information into a value creating process. Cost is also involved. Knowledge management has to take care of this cost, which means training people's agility and learning capacity.

Renewal : means that knowledge and information has to be adapted, transformed, destroyed and renewed all in the time process. For example, business intelligence and customer relations management need this renewing ability with clients and environments constantly changing. This concept entails knowledge management being sufficiently agile to transform its own vision and knowledge.

This Capture-Transfer-Renewal (CTR) model is a target for the next generation of knowledge management. It is not yet mature, as it needs a systemic approach and global understanding of organisations and human culture.

Humans are the Key

The notion of intellectual capital has the advantage of encompassing the polymorphism of knowledge: being at the same time information,

expertise, skills or experience, it signifies and groups together all these elements. It also englobes the challenge of knowledge management, which is to progress simultaneously and globally in the areas of information, organisation, management and HR management.

Let us begin with the most visible and concrete aspect, technology;. Should knowledge management be considered as a supplementary function to IT systems, is it a specific IT system or is it something completely different?

The debate can only move forward if one redefines the parameters, and this can only be achieved by a pluridisciplinary interpretation. Work psychology, company anthropology, learning and teaching methods and the cognitive sciences show that knowledge and memory are more than an information system. A number of achievements in these fields can throw some light on the subject.

Memory is not simply a storage of information, needing only to be pieced together again like a video sequence on demand. It is fundamentally a creative process using certain recorded material reconstructed and reorganised and adapted to the requirements of each new context: «the past is unceasingly reconstructed by the present»¹.

As well as this, one should equally consider that the motor for action is not simply cognitive but more deeply emotional. Numerous recent neurobiological studies have shown that knowledge is the outcome of various, multi-level interactions between impulses, emotions, feelings and consciousness².

The continual interaction between knowing and doing has major effects on the knowledge management project. Knowledge is not an object, it *is* the interaction between knowing and doing. Information alone does not permit awareness of this interaction to exist, and that is why IT is simply a tool for leveraging knowledge management.

The efficiency of IT, as with all technical systems can, therefore, not be judged in itself. What counts in a company's performance is the interaction between IT and the living organisation, the human beings. If the prior is optimised independently from the cultural and human organisational context, the optimum is not optimal.

¹ Jean Piaget, *Problèmes de psychologie génétique*, (Problems of Genetic Psychology) Denoël/Gontier, Médiations library, 1972

² See for example Antonio Damasio : *Le sentiment même de soi* (Conscience and Emotions) , Published by Odile Jacob, 1999

So what does a knowledge management system have over an IT system? It could be said that it involves an approach where the sum of tools-organisation-human beings are considered and improved rather than only one of the three elements of the global system.

This also explains why managing human resources is not enough to ensure efficient knowledge management. For example, a training policy will be more effective if it is rooted in what is actually going on in the work situation. Today company university projects and e-learning are trying to use Intranet to bring training courses to the users in the work context. This is not automatically successful. The risk is of tele-training being too mechanistic and insufficiently human. However, potentially, it could fundamentally transform learning methods within companies³.

The Age of Expansion

Intellectual capital is to be found working at every level, in people, processes, tools, organisations. The real problem of second generation knowledge management is being professional at every level and in all functions: Particularly in HR, IT, management and communication.

Careful observation of the principal concerns of companies' general management show a paradigm of knowledge management springing up sporadically. Let us look briefly at the EDF example, as presented currently in the economic press⁴.

The theme of knowledge management appears clearly, though implicitly in transformation programmes launched by top management:

- «Human capital is the key to tomorrow's Group» to:
 - Reanimate personal commitment to jobs.
 - Acquire necessary new skills.
 - Enhance the value of existing competence in teams.
 - Develop an innovative attitude.
- «Opening transversally and to the outside world is everyone's business»:

³ See for example : Corporate e-learning : Exploring a New Frontier ,
http://www.wrhambrecht.com/research/coverage/elearning/ir/ir_explore.html

⁴ For example The survey in *Les Echos* : *Voyage au sein d'une entreprise sous tension* (Journey in a Company Under Stress /, 13 au 16 février 2001

Comparing oneself constantly with the outside,
Functioning through networks,
Knowing what information to look for and how to look for it.
Towards useful information: gather, re-organise, transmit to
render valuable.

- «Intranet is a lever for change and business transformation ».
Company portals become business knowledge aggregators.
Insure the security of information and know-how.
Security of the company heritage should become company
culture.
- «Performance and Quality are dependant on knowledge being
efficiently managed».
Display results, share, transfer.
Improve team management.

Two examples

However, top down directions are not enough. A gap remains between announcing the company's strategy and the ability to professionalise knowledge management in operational projects, consequences of the company's strategy. This concerns equally; information system project managers, those in charge of HR management, and managers in charge of teams or company departments.

To illustrate the diversity of contexts let me quote two (among a hundred other) examples of knowledge management orientated projects at EDF.

One of the International and European Division's missions is to support the group's subsidiaries, in view of contributing to their development and economic profitability. It is not only a question of improving the profitability of each subsidiary but of setting up a truly global approach: sharing good practices, managing networks of expertise, benchmarking, giving access to portals of common resources via Internet, etc.

The second example: EDF's Regional Delegations in charge of relationships with industries, institutions and local bodies organise the networking of managers of different Units so that good managerial practice and relationships can evolve, listing service providers, publicising local interests, capitalising on internal or external information, developing discussion forums on transversal problems

etc. Here also, an Intranet portal serves as a lever for sharing and accessing knowledge, and for managing various networks.

These features are not simply IT systems. Each one involves organisation, specific management and continual animation, all essential conditions for success.

However, on a company scale, only the innovators are fully aware of the extent to which knowledge plays a role in their projects. For the majority the paradigm remains hazy. Too often discourse and reality are disconnected, and above all, new experiments remain local and contextual. People's experience is not yet made available for use by others. The phenomenon has not yet been culturally propagated.

With this in mind, a complementary plan of action has been set up at EDF : a knowledge managers' network. Instigated by one of the directors (Information Technology Division), a hundred or so knowledge managers have been brought together. Each of them brings with them their position within their work structure, their core competence and an operational approach to knowledge management.

The network's main objective is a cultural challenge. It is a question of empirically inventing pragmatic means of acquiring professionalism in knowledge management where it is needed, which is complementary to the hierarchic structure and the company's main material projects. The network is potentially favourable to this proposition. To get a clearer picture I will resort to a notion which is fertile in many areas: percolation;

The Percolation Strategy

To take a classic metaphor, consider a seascape scattered with innumerable small islands. In normal climatic conditions these islands would not be connected. If the sea level were to fall, small groups of islands would gradually start linking, but globally the sea would remain predominant, until at a certain level, through a slight variant, the majority of the islands find themselves suddenly connected. Beyond this level, which we call the percolation threshold, the environment becomes a continent.

Up until now, knowledge management in companies has remained below percolation level. Innovation has been effective in certain areas

but what is lacking is an overall vision, the capacity to make the concept and methods one's own where necessary, and to implement in ways appropriate to local constraints.

A complete transformation can only come about through cultural integration at all levels. A top down, uniform approach is not the answer but rather a multiple, everyday taking on board in different contexts. The ultimate aim of knowledge managers, as mentioned above, is to be catalysts for the *transitional phase* which would constitute the second generation of knowledge management. Already in EDF, apart from the hundred or so knowledge managers, thousands of collaborators and managers are getting the « knowledge agility ».

Thanks to my colleagues at the EDF who have contributed to the spreading of knowledge management in their operational projects, and particularly Michel Castan and Patrick Theuret, for their contributions to this paper.