When Knowledge Management is not enough: Managing Capabilities in the Pharmaceutical Industry

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During the past decade, companies have struggled with quality improvement, time-based management and reengineering. The improvement efforts following these approaches to business elevation have focused on quality, productivity, cost and time, but have often neglected the aspects of individual and collective knowledge required to establish new organizational forms and exploit new business opportunities.

It was only consequential that Knowledge Management (KM) would appear and be launched as a fix to the lack of focus on knowledge creation and sharing that earlier methodologies had shown. Organizing around knowledge, deploying advanced information technology for knowledge sharing throughout the enterprise, expertise available on-line on a global level. Appealing concepts to every business executive.

As a result, all companies with some self-respect have now embarked on Knowledge Management projects and consultants have included it into their standard product portfolio. However, while many executives tend to see Knowledge Management as some kind of final destination in their quest for improvement, we would argue that KM is not the last piece of the puzzle, but one further step into the exploitation of human potential. In order to reap the full benefits of knowledge, it is just as essential to consider the knowledge-related capabilities, i.e. the competence of turning knowledge into purposeful action. In the following, we will outline the idea of capability management and describe the application of the concept in the area of pharmaceutical R&D.

Knowledge Management

Knowledge Management is often described as an organization's ability to handle employees' knowledge in a way that makes it accessible throughout the company, improving it's competitiveness and ability to innovate. Namely four activities are considered as being the core of Knowledge Management: Generating, organizing, refining and distributing the content that is considered as the basis for knowledge creation (March 1997). **Generating** refers to the identification and creation of a structure for the content and the contributions from individuals to the collective repository. Getting people to submit ideas, experiences, formal reports, etc., is the most important, and crucial, aspect. **Organizing** involves the storage, categorization and indexing of content in a way that allows easy access and navigation by other users. Also, contextual relationships between various elements are created and links between various sources and related content elements are established. **Refining** is aiming at improving the content value by introducing more elaborated mechanisms for searching and retrieving content, but also the linkage to other information, such as external sources. **Distributing** is the process of providing content access to individuals throughout the organization. The distribution process, independent from the media that is chosen, must deliver value to the user and enable and encourage the use of information and creation of knowledge, thus creating incentives for participating in the generating process.

Sveiby (1997) has developed a concept for managing and measuring intangible assets, built on the notion of explicit and tacit knowledge, which has been described by Nonaka and Takeuchi (1995). He argues that knowledge is a virtually infinite source of wealth that grows when it is shared. Sveiby uses a 2x2 matrix, that contains four organizational contexts for the knowledge sharing and conversion process.

Exhibit 1: Sveiby's knowledge conversion contexts

To / From	Tacit Knowledge	Explicit Knowledge
Tacit Knowledge	Socialization	Externalization
Explicit Knowledge	Internalization	Combination

Socialization refers to the process of sharing experience, thereby creating tacit knowledge. The development of mental models or skills is typical for this setting and conversion often takes place through observation and imitation, i.e. that the written or spoken work is not sufficient for the process. **Internalization** is the development of tacit knowledge through the absorption of explicit knowledge. Narratives, stories and written documents are media that can be used for facilitating internalization. **Externalization** is a way of making tacit knowledge explicit. Tacit knowledge can be expressed in the form of metaphors, models and methods, but these media can not represent all aspects of the tacit knowledge and do therefore only represent a reduced picture. **Combination** refers to the creation of formalized knowledge systems through analysis and synthesis. Most of the IT-support for knowledge management are actually systems for creating and adding to the existing body of explicit knowledge.

When looking at the implementation of Knowledge Management in practice, the use of IT in form of systems for capturing, organizing and distributing knowledge is also a frequently mentioned critical success factor. The systems in use, often built around groupware infrastructures with shared databases, are supposed to enable the efficient re-use of individual knowledge, once it has been entered into the system, thus providing mechanisms for turning individual into collective knowledge.

However, the common approach to Knowledge Management, as we have described it here, can be challenged from several perspectives. (1) Knowledge is not a property or good that can simply be transferred between people. (2) Information technology cannot be generally applied. (3) Creativity and innovation as a result of peoples' knowledge is not only the result of individual thinking, but often emerges from social interaction. (4) In order to deploy knowledge efficiently, we need mechanisms for turning it into action.

Let us first elaborate on the notion of knowledge as an exchangeable property or good. Obviously, knowledge is not a good that can be found in the environment and that can be acquired for free. Knowledge must be created and for creating it, we require information that is related to a frame of reference. Once knowledge has been created, parts of it can be kept as an externality in the environment, but other vital elements are owned and maintained by the creator. As Demsetz (19XX, p 171) points out, creating and maintaining knowledge is not for free: *"Economic organization, including the firm, must reflect the fact that knowledge is costly to produce, maintain and use"*. Consequently, any effort to manage knowledge efficiently, must take into consideration the economics of knowledge. Reducing the cost for knowledge creation, maintenance and transfer is crucial and organizations have addressed this problem in different ways and developed different organization and infrastructure strategies.

Demsetz (ibid) is proposing specialization as the primary mechanism for reducing the cost of knowledge production. Situated learning, learning by doing and experience gathering as part of daily activities are, in fact, affecting knowledge cost. Specialization can thus be considered as an attempt to improve knowledge creation, while reducing the cost being associated with it. On the other hand, we can make a strong case against this argument. If specialization is the most feasible strategy for knowledge creation, the world would consist of specialist agents, each with in-depth knowledge within a single narrow branch. This structure would require the existence of an economic system in form of a perfect market, facilitating the exchange between the specialized actors. At this point, we enter the problem of economic organization, organizational forms and infrastructure as means to facilitate the knowledge exchange between agents.

Exchanging knowledge that has been produced via specialization requires that this knowledge can be, if not understood, at least assessed also by non-specialists. Otherwise, it is impossible to attribute a value to it. Demsetz (ibid) proposes two settings in order to make the exchange process work. Either the knowledge is embedded into an exchangeable product or service, or a long-term relationship is maintained between the agents being involved in the exchange process. The first setting resolves the problem by "packaging" the knowledge into an object that can be understood by non-specialists. Typical examples are computer software, or cars. Using software or driving a car requires no knowledge about the development and production process. In the second scenario it is assumed, that the long-term relationship between knowledge provider and receiver can enable the transfer of the contextual frame, or at least the vital parts of it, that is required to understand and use the knowledge that is exchanged.

Considering these settings we can conclude, that information technology does play different roles in them. In the first case, IT can support the exchange of the knowledge containing object. Accordingly, its role is primarily to facilitate the market mechanisms that govern the exchange process. In the second case, information technology can be employed for retrieving, storing and transmitting knowledge, but cannot easily be used for capturing frames of reference. Memos, emails and other documents only one part of the organizational memory and knowledge stock. The situation, the idiosyncratic knowledge and jargons are important elements of knowledge's context and part of the specialization required to understand and use the specific knowledge.

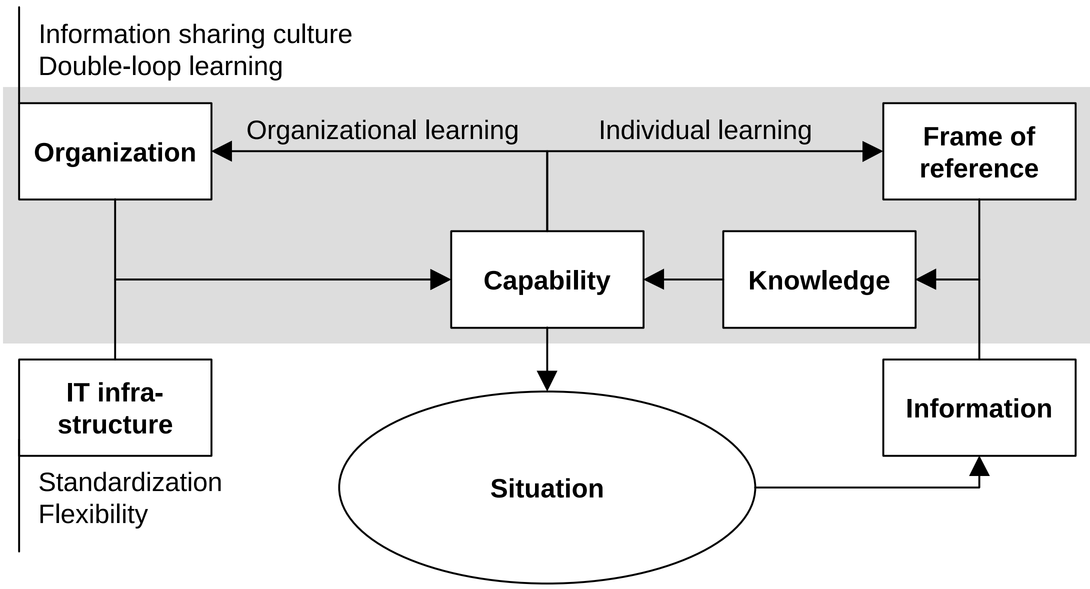
Knowledge is not only produced via specialization and the process of embedding it into exchangeable objects. Interaction is another important mechanism for knowledge creation. Creativity and innovation, as a result of peoples' knowledge, is not only the result of individual thinking, but emerges from social interaction processes, involving different actors with their individual and specific contexts. Social interaction is also a way of recombining knowledge and creating new one from the spin-offs of the interaction process. Social interaction can thus create knowledge in two ways. (1) Actors with the same, shared, understanding of a problem can combine their reciprocally understood ideas to new knowledge (Nonaka 19XX). (2) Socialization can enable actors with radically different understandings to provide different interpretative models that are resulting in the creation of new knowledge on the specific situation (March 19XX).

Last, but not the least, once knowledge has been created and exchanged, it must be turned into organizational action. This ability is a highly individual characteristic and can hardly be codified into rules or procedures. Neither can it be stored or transmitted by means of information technology. In order to turn knowledge into action it is, as Argyris (19XX) has put it, required to acquire the theory in use, i.e. the capacity of acting on the basis of the acquired knowledge, which is rooted in any action. This acquisition process is crucial, but difficult, and cannot be taken for granted when knowledge management is discussed. Let us conclude our reflections about knowledge with an example. Picture a first-time parachutist. This person has learned everything about the parachute and how it is folded, about how to jump and how to behave during gliding and landing. In other words, the person is highly knowledgeable about parachuting, but not necessarily capable of doing it. Being knowledgeable means to be prepared and equipped, but being capable means to be ready to jump.

From Knowledge Management to Capability Management

As we have seen, the concept of Knowledge Management, as it is promoted today, is associated with several shortcomings. While several of the factors that have been identified in knowledge management studies are related to the formalization and codification of knowledge, we are addressing the problem from the different perspective we have introduced above, mainly the aspect of turning knowledge into action, an issue we refer to as Capability Management (CM).

We define Capability Management, in a rather pragmatic way, as **the process of making knowledge actionable**. In other words, it reflects the ability of transforming knowledge into activities that are contributing to the achievement of business objectives. Thus, Capability Management is not a phenomenon that is isolated from other business activities, it is an integrated part and requirement for everything the organization sets to do and can, obviously, change over time in the same way as business goals and environmental circumstances. Also, Capability Management is not separated from Knowledge Management, but is its logical continuance. Consequently, CM can be considered as a second, deeper level of the knowledge management problem. At the same time, it is also related to the context within which knowledge is created and transferred and constitutes one element of the setting that is defining the context of action.



The knowledge/capability loop

Capability Management in pharmaceutical R&D

Pharmaceutical R&D is generally recognized as a process with high knowledge content in the process itself, as well as with respect to its outcome. However, R&D is not only a knowledge intensive process, it also requires certain capabilities. These range from decisions regarding the insourcing or outsourcing of research activities and the execution or termination of research projects, over the conduct of clinical trials, to sales and market support. Even though these issues are here expressed in terms of business-related decisions, they are basically referring to the question of knowledge creation and transfer and the capability of executing these activities.

From having been one-stop-shop like, large and integrated corporations, the pharmaceutical industry is moving towards a network of organizations that are co-producing knowledge in different settings, ranging from cross-functional and cross-organizational teams to strategic alliances and outsourcing. The current wave of mergers and acquisitions does not contradict this development, but is an expression for the fact that even large companies are unable to conduct all activities along the value chain effectively.

Looking at pharmaceutical R&D we can conclude, that not all activities can be conducted within the department, i.e. that not all of the required knowledge and capabilities are available within the organization. Instead, R&D departments are becoming nodes in a network, focusing on the collection and recombination of knowledge that is created and gathered in other, specialized parts of the network. Since the actors in the network also share a common frame of reference, the exchange, understanding and use of knowledge within the network is considerably easy and can also be supported through the use of information technology. Considering the knowledge intensity of the work and the dynamics of the industry, the network approach seems to be the only one that is able to provide the necessary richness to fulfill the requirements of a pharmaceutical R&D department. In this setting, knowledge has to be created in both the ways we have already mentioned; through the richness arising from the common knowledge and shared frames of reference of specialists, and through the import of ideas and knowledge from other fields. Managing a network of commons while, at the same time, being open for outsiders with different knowledge and reference frames is an act of balance that only can be described in terms of a capability, i.e. as knowledge in action. However, while this capability is crucial to the success of the network as a whole, it is also difficult to achieve and maintain. Depending on the local formative context, organizations and individuals in the network will behave in different ways, situate action and knowledge creation and sharing processes.

Important questions for pharmaceutical companies to be asked in this context are:

1. On what grounds should decisions about clinical projects be taken?

2. How can clinical projects be executed in the most cost and time efficient way, without compromising quality and documentation requirements?

3. Which organizational and technological infrastructures should be developed and deployed for ensuring that the above aspects can be handled?

Addressing any of these questions naturally implies profound knowledge in several fields, but it also requires the capability of using it. Taking decisions about projects means to move large sums to or from research areas. Executing projects requires knowledge about best practices, but efficient project management must be implemented and exercised. Designing and deploying infrastructures that are flexible and serve current and future business needs implies knowledge about feasible organizational forms and enabling technology, but also the capability of developing and putting infrastructures in place and cultivating them. Capability Management in pharmaceutical R&D is thus about fostering, nurturing and improving these abilities.

Conclusion

Capability Management is about people, their knowledge and the formative context. It deals with providing people with competencies that make them knowledgeable, and the knowledge they possess actionable. It is not about providing people with information and assuming that the right decisions and actions will automatically emerge from that.

An important issue in this context is how a fertile ground can be prepared for Capability Management to grow and develop. The mechanisms that can be employed for this purpose are:

1. Development of an action-based culture and organizational that promotes proactive behavior before reaction.

2. Consideration of mistake making as a part of human behavior, not a reason for punishment.

3. Application of Knowledge Management as a prerequisite for developing capabilities.

4. Creation of organizational structures that leaves room for actionable behavior.

5. Development of technological infrastructures that are flexible and adaptable to fast turns.

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