

STRUCTURING KNOWLEDGE MANAGEMENT – CLASSICAL THEORY, STRATEGIC INITIATION AND OPERATIONAL KNOWLEDGE MANAGEMENT (part I)

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Abstract: The article is the generalization of experience of the implementation project, which has been treated as well as a research field. The results are presented in two parts. The first part includes: a description of the classical approach to knowledge management and shows the concept of structure of process of knowledge management with a description of the procedure in each step of the process. The key idea is to divide the process in three spirals of actions: spiral of perfecting the collection of knowledge; spiral of the perfecting of the formulation of knowledge; spiral of perfecting the utilization of knowledge. Part II of this paper is article *Structuring Knowledge Management – Levels, Resources And Efficiency Areas of Knowledge Management* (DOI: 10.1515/fman-2015-0042).

Keywords: wisdom, knowledge processing, knowledge management system, knowledge, knowledge management.

“The irony of life lies in the fact that one lives it going forward and understands it looking back”

Soren Kierkegaard: *On the concept of irony with continuous reference to Socrates*

1 Introduction¹

The article explains the classical approach to knowledge management as a starting point for further consideration. On the basis of this approach the article presents an original (verified in the practical implementation of a large knowledge management project) concept of the structure of the process of knowledge management as well as successive steps of the implementation process. The author regards this to be original and valuable for the development of the theory of knowledge management of the application of the approach of sustainable

management [13, pp. 57-62]. The dominant research method was *action-research*².

2 The essence of the classical theory of knowledge management

The “definitional” issue – what is knowledge – is complicated and various interpretations based on both the discipline of management and economics are possible – either using an institutional or cognitive approach (for a review of approaches see [1, pp. 165-168]). For the purpose of this article, I assume that knowledge is an intellectual resource, created with the usage of data, information and experience, which can be useful to utilize in conjunction with the

¹ The article is a generalization of a project executed for a municipal heating company in a large city that was organizing, for the first time, systematic corporate knowledge management. In the framework of this project a dedicated solution of knowledge management was developed in a network organization with a large range of functionality. The project was the implemented solution that enabled by knowledge management, the challenge of ordering experience and potential competences: R&D center, factories of heat, municipal distribution networks, service centers, customer billing center, and specialized organizational units of business analytics. The specific aim of the project was to increase the value of the company in connection with the privatization prepared. This was treated as a starting point for consideration of the operationalization of the approach

² The action-research method is a democratic process, whose purpose is to obtain practical knowledge. Its task is to join action with reflection, theory with practice, by means of acting with others in the process of searching for solutions to important problems and to search for the development possibilities of individuals and entire societies. This is a process in which the researcher together with practitioners as the recipients of research, that is, with persons from the milieu in which the fundamental questions are asked, systematically look for answers to existing problems. Experiments are undertaken in relation to real, concrete problems in societal systems, for example, in organizations, with the intention of their positive solution (Reason P., Bradbury H. (red.) - *Handbook of Action Research: Participative Inquiry and Practice*, Sage Publications, London 2001).

goals of an organization or that can be at the service of the organization and its employees or that can be foreseen to be generated or obtained. The concept of knowledge can be analyzed at various levels, which in turn leads to the concept of the “hierarchy of knowledge”, which is represented by a five-step pyramid made up of the foundations of data, information, knowledge, its understanding and of wisdom.

The interpretation of the pyramid is the following: information is data to which has been given a context and meaning, and knowledge is information to which can be given an application and wisdom is knowledge based on experience [2, p. 22]. In this approach, knowledge is tied in with its understanding and acquaintance by man, while knowledge management is the domain of an organization that socializes people involved with it and utilizes information codified in its surroundings (classical approach according to [5, pp. 80-81]).

While in the classical (psychological) understanding, socialization is the process of acquiring identity and values, convictions and approaches as well as the rules in experiencing the world in order to efficiently function in society, in the understanding of knowledge management, it can mean the efficient functioning in an enterprise [10, p. 442].

Knowledge management is part of the management of an organization and, itself being a process, encompasses the processes involved with localizing, obtaining, creating, transferring, utilization and retention of knowledge for goals of the organization to which belong analysis, planning, operations and control.

Knowledge management in an institutional aspect is based upon an analogy of the utilization of knowledge by a person or group of people. It is to support the obtaining of such goals of the organization as: the building of new competences, the improvement of the effectiveness of organizational action, quick adaptation to changing surroundings and achieving a competitive advantage. The effectiveness of such management requires that formal and technical solutions serving knowledge management were as flexible as possible to the level in which man operates, obtains and uses knowledge. [1, pp. 167-168].

Generally, knowledge is divided into open or explicit, and into hidden or tacit. Organizational theory of utilizing knowledge places emphasis on the role of tacit knowledge that is specific for given circumstances, and for a given organization. Enabling the continual transformation from one type of knowledge into another is the basis for the creation of resources of new knowledge in an organization [5, p. 85-86]. This process, designated as the converting of knowledge, has four main manners (stretched out in time and moving successively from one to the next):

- converting tacit knowledge of an individual into the tacit knowledge of a group (what is known as socialization),
- converting of tacit knowledge into accessible knowledge (what is known as externalization),
- converting accessible knowledge into accessible knowledge for the organization (what is known as combination),
- converting accessible knowledge into tacit knowledge (what is known as internalization).

In this manner, the spiral of the processing of information takes place.

In order to picture how the process of knowledge management takes place in an organization, it is worthwhile to point out the fundamental model of knowledge management [6, p. 42], in which six basic actions, which make up the process of management knowledge, are defined. The model describes two cycles: internal and external. The internal cycle encompasses: the identification, obtaining, development, dissemination, storage and usage of knowledge. The external cycle encompasses the process of the internal cycle plus the additional designation of the goals and evaluation of the possessed knowledge [7, pp. 530-543]. Utilizing knowledge is described as the possibility of employing the knowledge resources in the process of production or provision of services and the key issue of this field is to inculcate within the member of the organization the need for making use of knowledge. The storage of knowledge occurs on three levels: individual, collective and technical-organizational [3, pp. 88-93]. On the individual level, one must take care that unique knowledge (basically expert

knowledge) remains in the organization. At the collective level – create the picture of the past of the organization and make distinct use of obtained competencies. At the technical-organizational levels – ensure access to all collected resources of knowledge (mainly documents), taking into consideration the continuity of the process of knowledge management. The evaluation of the knowledge possessed serves the purpose of critically looking upon the entirety of knowledge management and of knowledge resources. To such evaluation are utilized such tools as: the intellectual capital index, balanced scorecard, the degrees of freedom of enterprise architecture management, or process management [9, chapter 2].

3 Strategic initiation of systematic knowledge management

In general, organizations, from the point of view of knowledge management, are divided into two types. The first are those for which knowledge and information constitute a fundamental resource and the management and providing of access to knowledge and basic information is a business process. Examples of such are research and development institutions, consulting firms, information search systems and public administration registers. The second type of organization bases its business on the processes of producing goods and providing services and information and knowledge serves to more effectively realize their basic processes while knowledge management is an accessory process or sub-process. It has major significance in obtaining a competitive position in the market but is not a direct source of income.

In strategic knowledge management there are fundamentally only two strategic approaches that stand out: personalization and codification. The personalization approach is strictly based on the creative role of the person in the organization. The mechanisms of this approach serves to strengthen interpersonal contacts and in this manner make efficient the dissemination of knowledge. Its best illustration is the model of the relation: teacher – pupil. The codification approach, on the other hand, means the introduction of mechanisms of knowledge registration and in its extreme technical version – of IT mechanisms.

It should be emphasized that these strategic approaches do not exclude each other. One should also be aware that the personalization approach is quicker and cheaper in its introduction (although that does not mean easy or easier). For this reasons that is their natural order of introduction. Between both strategic approaches (codification and personalization) occur differences that are visible in:

- the business strategy of an organization (repetitive or individual activity),
- an economic model (large or small scale of business),
- knowledge management mechanisms (persons to knowledge or persons to persons),
- IT technologies (IT technologies or culture of communication),
- human resources (standardization of proceeding or nurturing of creativity), and
- relations with clients (client seen collectively or individually).

Even such a basic review of differences show that the management of each organization should consciously utilize the appropriate characteristics of each of these approaches. The question is: the appropriate proportions and the initial order in which the solutions are introduced. Proportions, to a significant degree, depend upon the specificity of the given field of knowledge.

In designing a system of knowledge management the proposed solution framework [8, pp. 136-139] should:

- show the fields of knowledge and their owners on the basis of searching for authorities (teachers) and their professional doubles that accompany them as their pupils/continutors,
- recommend individual career path type HR mechanisms that favor knowledge management,
- propose for fields of knowledge, based on evidence and experience, codification techniques that ensure the making public of registers of knowledge (documents, descriptions, etc.),
- propose for fields of knowledge that are of an analytical / application nature a codification technique that serves to more effectively conduct analysis and the generation of syntheses.

The gradual replacement of the strategic approach of personalization with the approach of codification also creates the possibility of agreeing the superficially contrary models of decentralized and centralized knowledge management.

The basic distinguishing points of the centralized model are:

- building on explicit knowledge,
- building on the collection of data, information and knowledge in computer databases,
- preparing mechanisms for the reaching of databases on experiences collected during projects and one time, unique or experimental actions,
- the playing of a primary role by information technologies,
- the dominance in an organization of problems of an operational nature that are relatively easy to code, store and present in the form of instructions, databases and repositories of knowledge.

On the other hand the basic distinguishing points of a decentralized model is:

- building of transferable knowledge by direct actions on the basis of continuous monitoring,
- building upon the direct transfer of data, information and knowledge between employees of the organization,
- focusing on the creation of new knowledge as solutions for new challenges.

The mutual functioning of both models is possible. The second model can be in place during the utilization of centralized databases and information systems (and in the future, IT systems), while the first model can be in place during the operational usage of knowledge in sophisticated professional activity (for example, project management or just in design). Analogically, this difference can be reflected in the management at the highest and at the lowest levels of the professional hierarchy.

In a strategic approach and then in a general, systemic, and long-term approach, knowledge management is conditioned by general informational conditions in the enterprise or in its surroundings, while within the enterprise most important is the human factor. If the situation in the organization can be described as a clearly dynamic variable as concerns internal

conditions and relatively stable as concerns relations with its surroundings, this signifies a situation known as the “strategy of the codification of knowledge” which is based on the quick transformation of personalized (individualized) knowledge into knowledge codified into the form of documents and databases and in which emphasis is placed on the registration of knowledge that hitherto had been only personalized and which could have been easily lost during employee rotation. In the long-term, such an arrangement can change, that is there can occur an increase in the volatility of the surroundings and then the situation will show the need for the “strategy of knowledge diversification” which is based on the formalization of knowledge already existing and the obtaining of new knowledge and its application though, if, as a result of actions by the organization there occurs a stabilization of internal conditions, then, with the occurrence of expected external turbulence, the situation creates the need of a “strategy of new knowledge” which is based on the observing of the appearance of new knowledge and its acquisition creating the ability of its absorption and which actually is contained within the previous strategy.

4 Strategic knowledge management³

Actually, the indication in the theory of management of multiple knowledge management strategies arouses a logical doubtfulness (can there be many strategies when each of them can in practice be joined with others?). Thus it should be understood as modules of strategic actions for clearly distinct models of acquisition and usage of knowledge. As criteria for making such distinct the following are applied:

- the character of the process – creation or transfer of knowledge,
- the fundamental source of knowledge – internal or external,
- the dominating character of knowledge – existing or new.

On this basis six possible modules can be distinguished:

³ The characterization put forth on this point is based on [3, pp. 11-36]

- module of strategic actions in the creation of knowledge via mutual action,
- module of strategic actions of the creation of internal knowledge,
- module of strategic actions of the absorption of external knowledge,
- module of strategic actions of the internal dissemination of knowledge,
- module of strategic actions of the protection of knowledge, and
- module of strategic actions of the provision of access to knowledge.

The module of strategic actions of the creation of knowledge by mutual action is based on the search (purchase) of new knowledge from a competency/knowledge center (for example, a research institute) including for the purpose of inspiring of the substantive creation of new knowledge by such a center. Actions in this area can be, for example, special market research ordered from a specialized company or technical or organizational consultancy, etc.

The module of strategic actions for the creation of internal knowledge concerns research organizations and knowledge hitherto not existing either within an organization or in its surroundings and which is to be created. In these organizations the process of knowledge management can even constitute a basic business function. Such a case can occur in, for example, the form of conducting a research and development institute within an industrial plant or concern but also within lesser, and creative, forms of professional activity such as the rationalization movement or quality clubs.

The module of strategic actions for the absorption of external knowledge concerns knowledge existing, but from without the organization that needs it, and thus it should be acquired. This is a pretty typical manner of operating in knowledge management.

The module of strategic actions of the internal dissemination of knowledge is based on knowledge already existing within the organization (thanks to, perhaps, the application of one of the earlier described strategies) and induces the preparation of mechanisms of dissemination related to the character of the knowledge (explicit, tacit) as well as the

relation between the degree of codification and the personalization of knowledge. This is a pretty typical manner of operating in knowledge management.

The module of strategic actions for the protection of knowledge as well as the module of strategic actions of the provision of access of knowledge are their opposites and are not applied together in relation to a given area and range of knowledge. They have, although, their application in clearly indicated information and areas of knowledge. In a specific project, this matter is taken into consideration in such a way that:

- the uniform fields of knowledge are separated on their merits and grouped into functional megareas,
- the policy of information security of the organization is modified in order to ensure the protection of knowledge in keeping with the principles of applying the attributes of informational security [11, pp. 21-22], and
- particular fields of knowledge are assigned to the appropriate modules of strategic actions.

The actual strategy assumed by the organization is a combination of these modules either in the sense of the search of syntheses of solutions personified by them or by the separation of information and knowledge into fields of knowledge, which are encompassed by a separate module of strategic actions. In light of this, even the two last modules, which fundamentally exclude themselves, are simultaneously applied in managing various areas of knowledge.

5 Operational knowledge management

It focuses on the wider development of knowledge, because only this guarantees to keep up with development and a competitive market.

Examples of manners of developing knowledge are presented in Table 1.

In an organization individual modules of strategic actions coexist either in a sequential arrangement during the perfecting of the level of knowledge management, or pertaining to various areas of knowledge.

Table 1. Manners of developing knowledge
(source: prepared on the basis of [3, pp. 29-33])

| Modules of strategic actions of knowledge management | Manners of realization |
|--|--|
| Module of strategic actions in the creation of knowledge via mutual action | <ul style="list-style-type: none"> • cooperation with academic and research (laboratories) centers • commissioning analyses, for example market research • ordering of consultancy/expert reports |
| Module of strategic actions of the creation of internal knowledge | <ul style="list-style-type: none"> • own research/development center or laboratory • internal analytical teams organized ad hoc to solve an identified problem • rationalization, quality clubs, etc. |
| Module of strategic actions of the absorption of knowledge | <ul style="list-style-type: none"> • benchmarking research • courses, training, conferences and education • active contact with clients • cooperation with suppliers of specialist or expert knowledge • purchase of licenses • directing search in the Internet and in traditional publications • outsourcing fragments of activity as to become acquainted the competencies of others • acquiring employees having particular competencies and potential • e-learning platforms in cooperation with other organizations • network of external experts for which footholds are internal professional association clubs • scientific advisor council in the organization • economic espionage |
| Module of strategic actions of the internal dissemination of knowledge | <ul style="list-style-type: none"> • codification of explicit knowledge as well as systems of access to codified knowledge • systems managing the content that enable the codification of documents • milieu for exchange of experiences in the form of conducting video-conferences, discussion forums, electronic bulletins and libraries and internal newsletters • professional meeting seminars, discussion groups in the intranet • training, including e-learning, coaching mechanisms • lists of persons, experts who possess designated knowledge, places where one could find answers to particular questions, also presented in the form of knowledge maps • movement of internal knowledge volunteers (for example translators) • recruitment and motivational systems, career paths, etc. |
| Module of strategic actions of the provision of access to knowledge | <ul style="list-style-type: none"> • information security policy • classification of information • exchange of information with interested external persons / entities • sale of knowledge • Internet sites • image creation • publications |

Table 1. Manners of developing knowledge (cont.)

| Modules of strategic actions of knowledge management | Manners of realization |
|--|---|
| Module of strategic actions of the protection of knowledge | <ul style="list-style-type: none"> • information security policy • classification of information • patenting • clauses in agreements with employees • propagation of an organizational culture with emphasis on values such as loyalty and awareness • internal “counterintelligence” • systems of physical and IT security etc. |

A complicated phenomenon takes place made up of the current realization of assumed principles of knowledge management and simultaneously the perfection of this management that is appropriate to the assumed strategy of its development.

The directions of this development is most often described as the method of researching gaps, that is, the discrepancy between that which the organization should do and that which it actually does and thus between that which an organization should know or know how to do and that which it actually knows or knows how to do. This requires a series of analyses, beginning with the comparison of business strategies and its resulting vision of essential knowledge with the actual state of the organization, its tools and resources (particularly information and people as the conditions of existing and developing knowledge).

6 The process of knowledge management

The process of knowledge management should realize the principle of continuous improvement, which generally is a characteristic of a process-based approach in the management of an organization but in a particular manner meets the challenge that is efficient knowledge management. Knowledge increases in keeping with the operation of its elements and in light of this each course of the process positively (increase in value) changes. This process should be seen as analogous to the process of quality management. The particularity of such processes is based on the fact that persons responsible for the processes themselves – their “owners” – do not have to delve into the merits of their results and thus only monitor their formal and methodological correctness

which constitutes a mechanism which should lead to generating the appropriate results by those working on the resources (in this case of knowledge divided into areas) of specialists and their apparatus. In particular areas of knowledge defined in the organization there are appointed managers of knowledge areas who are responsible for the organizational and substantive compliance of the conducting of a process in a given area including for the quality of the results of the process and for the planning and settling of accounts of tasks laid upon the employees and groups involved in the given area of knowledge.

The proposed structure of the process of the further processing of knowledge is based upon three spirals of actions that are mutually cooperating but running in separate cycles and which have different functions and character of proceeding. The organizational structure created for knowledge management basically only deals with the two first spirals, that is with the *spiral of perfecting the collection of knowledge* and the *spiral of the perfecting of the formulation of knowledge* (codification), the third, that is, the *spiral of perfecting the utilization of knowledge* is already in the direct operational sphere (see Table 2), in which knowledge is used in keeping with the needs formed by the requirements of a given business service supplied on behalf of an external or internal client.

The process of knowledge management should be closely related with the components of the system of general management as well as the system of knowledge management, such as:

- knowledge itself, its character, structure, and levels,

- the effective general process of management,
- human relations based on trust,
- efficient and user-friendly information technology,
- an organizational culture orientated towards knowledge,
- flexible organizational structure, and
- measurements of effectiveness / performance and motivational solutions related to them.

The proposed approach to knowledge management is illustrated by Fig. 2 and described in Table 2.

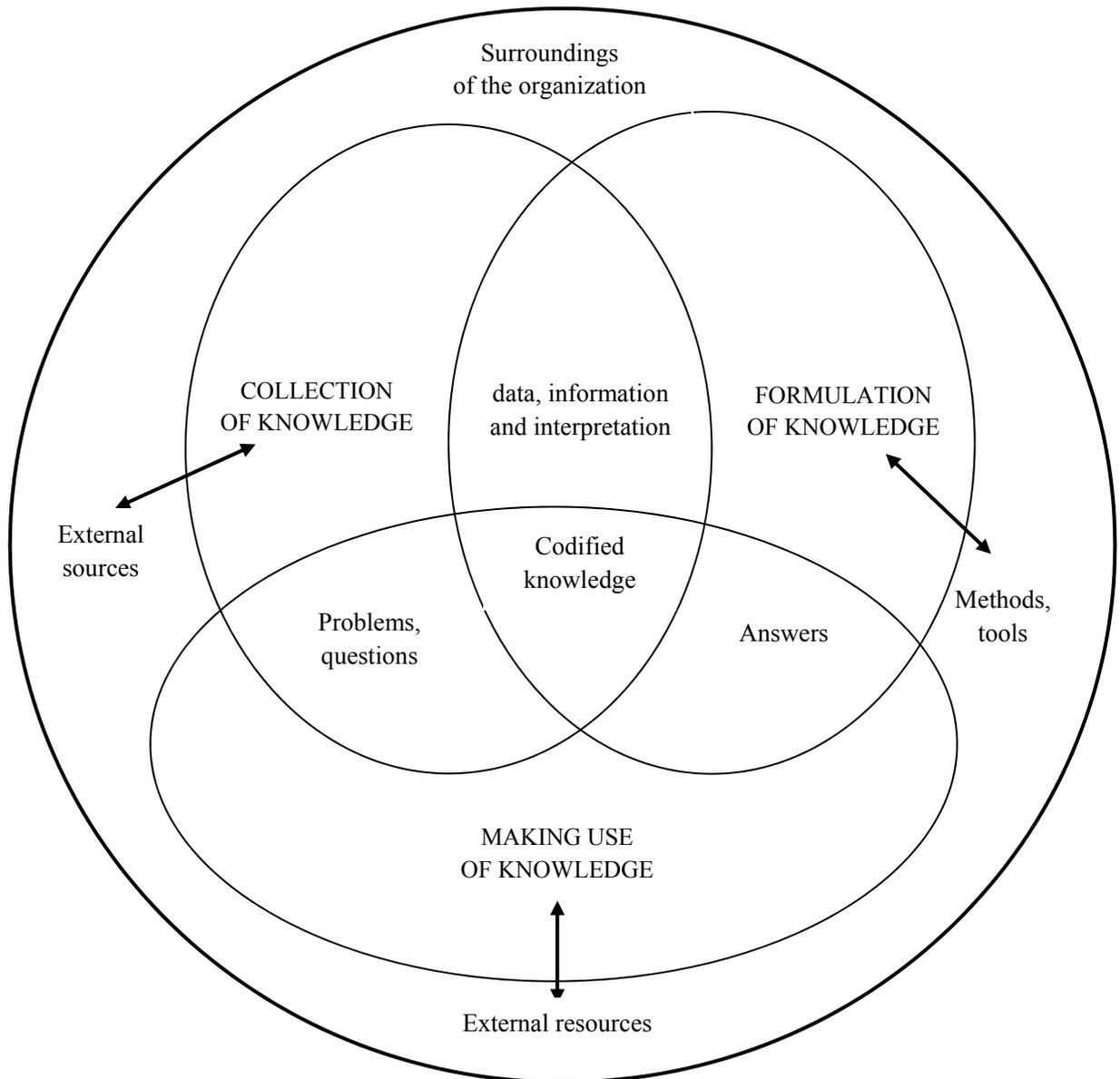


Figure 2. The idea of the process of knowledge management
(source: [12, pp. 729-735])

Table 2. The structure of the process of knowledge management
(source: [12, pp. 729-735], inspired [1] and [9])

| Domain of the management of the enterprise, including the supervision of knowledge management | | | Characterization and initiating events in the map of the process |
|--|--|--|--|
| Domain of direct knowledge management | | Domain of business processes | |
| spiral of perfecting the collection of knowledge (SPC) | spiral of the perfecting of the formulation of knowledge (SPF) | spiral of perfecting the utilization of knowledge (SPU) | |
| Regarding action in the form of a spiral by means “formulation” is meant not only the original editing/completing but also cyclical actualization/modification/supplementation | | | |
| <p>1. (SPU)</p> <p>Needs (consciously formulated or only felt). With as much preciseness as possible, the following submission is made:</p> <ul style="list-style-type: none"> • What kind of knowledge is needed? • Who needs such knowledge? | | <p>This stage is initiated:</p> <ul style="list-style-type: none"> • by a managerial order as an initiation of a cyclical action and also for the purpose of undertaking an audit, • ad hoc need, for example, during the repair of a breakdown and in relation to a deficiency in the documentation – the need to obtain informal information from an experienced person, • systematic conclusions – as a result of observing – of development, exploitation, investment needs, etc., • from this stage it is possible to go to stage 2 which will initiate the full cycle of knowledge management, or to stage 17, if the needed knowledge is already codified. <p>This is an event initiating the sub-process “A question was raised about knowledge” in the process of processing knowledge.</p> | |
| <p>2. (SPC)</p> <p>Identification of needs (researching needs, analysis of needs, problems, questions) Verify:</p> <ul style="list-style-type: none"> • What knowledge is needed? <p>Who needs this knowledge?</p> | | <p>Actions in this stage can be:</p> <ul style="list-style-type: none"> • Occur by themselves and result from the tasks of a given position/cell, which was created just for such tasks, • Result of the initiation of this stage in the successive course of the spiral of perfection, • Answer to the need of submission of an ad hoc need, which in addition is verified, whether the need is more general, <p>This is an event initiating the sub-process “A question was raised about knowledge” in the process of processing knowledge.</p> | |
| <p>3. (SPC)</p> <p>Identifying the sources of the realization of needs (internal or external, persons or institutions, systems or documents) Establish:</p> <ul style="list-style-type: none"> • What knowledge is already possessed and thus what is the gap in knowledge? • Where can this knowledge be found? • Who can this knowledge supply or create? | | <p>Actions at this stage:</p> <ul style="list-style-type: none"> • first, one refers to the resources of explicit information already collected, which is located in the repository (which concept should be interpreted very broadly), • when it is lacking, aim at establishing other sources of explicit information. <p>In practice the border of the previous stage can be blurred but of much importance is in what mode was the actions of the previous stage initiated. This is an event initiating the sub-process “A question was raised about knowledge” in the process of processing knowledge or the sub-process “Preparation of a question supplementing knowledge” in the process of the processing of knowledge.</p> | |

Table 2. The structure of the process of knowledge management (cont.)

| | |
|---|--|
| <p>4. (SPC) Indicating the potential places of tacit knowledge (internal or external, persons or institutions, systems or documents). Establish: <ul style="list-style-type: none"> Who is the holder of such knowledge? To what extent is sit tacit knowledge? </p> | <p>Actions at this stage can be:</p> <ul style="list-style-type: none"> An element of systematic penetration of potential places of tacit knowledge; answer to specific - having a defined level or urgency – needs, including as a separate category - ad hoc questions. <p>This is an event initiating the sub-process “Identified internal knowledge” or the sub-process “Identified external knowledge” in the process of processing knowledge.</p> |
| <p>5. (SPC) Identification of beneficiaries (recipients or users) of knowledge (organizational cells or persons or systems or documentation)</p> | <p>Actions at this stage can have the purpose of designating:</p> <ul style="list-style-type: none"> beneficiaries in the case when the search of knowledge has a systematic character; additional beneficiaries in the case of a need of knowledge submitted in the ad hoc mode. <p>This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>6. (SPC) Identification of the form of transfer, codification, storage, verification, actualization. Establish: <ul style="list-style-type: none"> What relations should be created between the source of knowledge and its beneficiary? </p> | <p>Actions at this stage has for its purpose the consideration:</p> <ul style="list-style-type: none"> whether it is to be a permanent relationship; what rights and what responsibilities are its parties to have; what are the forms of transfer. <p>This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>7. (SPC) Classification of knowledge (separation of areas, issues, problems and questions,)</p> | <p>At this stage monitoring of the types of possessed and obtained knowledge is conducted. New knowledge is appropriately assigned. General knowledge is cyclically subject to evaluation whether its classification is appropriate.</p> <p>A particular question is the analysis and assignment of knowledge obtained as answers to questions submitted in ad hoc mode. It cannot fit into hitherto classification and constitutes a need in this area as well. It is most often this mode that reveals the most tacit knowledge.</p> <p>This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>8. (SPC) The organization of the obtaining of knowledge</p> | <p>The previous stages did not mean, that transferal of knowledge always occurred in their course. Meanwhile such transfer can mean various types of formal, organizational and technical actions, for example, the obtaining of rights, obtaining of technical tools, training of employees, etc.</p> <p>This stage closes the basic range of the spiral of collection of knowledge (SPC). In the framework of this spiral it is possible to move from the audit stage (21) or return to stage 2. From this stage there also occurs the joining with the spiral of the formulation of knowledge (SPF)</p> <p>This is an event initiating the sub-process “Identification of the need to obtain knowledge” or “Preparation of the question to supplement knowledge” or “A question was raised about knowledge” in the process of processing knowledge.</p> |

Table 2. The structure of the process of knowledge management (cont.)

| | |
|--|---|
| <p>9. (SPF) Designation of the form of transfer, codification, storage, verification, actualization</p> | <p>Actions at this stage have as their purpose the practical establishment of relations, rights, responsibilities and form, which were identified in stage 6. This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>10. (SPF) Selection of the method and tools of search (methods of analysis or aggregation, data collections, systems)</p> | <p>Actions at this stage are conducted when in relations to larger resources of knowledge it is possible to designate the formalized manners of searching portions of data. This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>11. (SPF) Descriptions of areas of knowledge</p> | <p>In this stage:</p> <ul style="list-style-type: none"> • the area of knowledge is defined in a manner, which enables potential users the narrowing of searches of portions of knowledge needed by them, • appearance of tacit knowledge, • codification of knowledge on the level of the area. <p>This stage has a logical connection with the results of stage 7. This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>12. (SPF) Descriptions of issues in the framework of areas</p> | <p>In this stage:</p> <ul style="list-style-type: none"> • the catalogue of issues that make up a given area of knowledge are defined, which enables potential users the narrowing of searches of portions of knowledge needed by them, • appearance of tacit knowledge, • codification of knowledge on the level of issues in the area. <p>This stage has a logical connection with the results of stage 7 and is executed according to possibilities and needs. This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>13. (SPF) Descriptions of problems in the context of issues</p> | <p>In this stage:</p> <ul style="list-style-type: none"> • the catalogue of problems that make up a given area of knowledge are defined, which enables potential users the narrowing of searches of portions of knowledge needed by them, • appearance of tacit knowledge, • codification of knowledge on the level of problems in the framework of the issue. <p>This stage has a logical connection with the results of stage 7, and is executed according to possibilities and needs. This is an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>14. (SPF) Formulating answers to questions in the framework of problems</p> | <p>In this stage:</p> <ul style="list-style-type: none"> • answers to questions, which make up a given problem in the context of an issue of an area of knowledge, are defined, which enables potential users to narrow searches of the portions of knowledge needed by them, • appearance of tacit knowledge, • codification of knowledge on the level of answers to questions in the framework of problems. <p>This stage has a logical connection with the results of stage 7, and is executed according to possibilities and needs. It often occurs directly after stage 11, particularly in the first period of systematic application of knowledge management. This is an event initiating the sub-process “A question was raised about knowledge” in the process of processing knowledge.</p> |

Table 2. The structure of the process of knowledge management (cont.)

| | |
|--|--|
| <p>15. (SPF) Atypical proceedings (for example, consultations)</p> | <p>This stage is conducted at discretion in the case of problems that are complicated, atypical, not clear or involving various areas of knowledge, including from external sources. This is an event initiating the sub-process “A question was raised about knowledge” in the process of processing knowledge.</p> |
| <p>16. (SPF) Archiving knowledge (copying, archiving non-current versions)</p> | <p>In this stage actions are conducted the purpose of which is to secure the resources of knowledge. This stage closes the spiral of formulation of knowledge (SPF). In the framework of this stage occurs a return to stage 9. From this stage there also occurs a joining to the spiral of the utilization of knowledge. This is also an event initiating the sub-process “Identification of the need to nurture knowledge including archiving” in the process of processing knowledge.</p> |
| <p>17. (SPU) Documentation of utilizing knowledge</p> | <p>In this stage, particularly:</p> <ul style="list-style-type: none"> • portions of stable knowledge are directly placed in the resources needed for individual business operations or positions, • tips or instructions arise on how to obtain needed portions of variable knowledge. <p>This is also an event initiating the sub-process “Supply of knowledge” in the process of processing knowledge.</p> |
| <p>18. (SPU) Training on the usage of knowledge</p> | <p>In this stage training is conducted, including;</p> <ul style="list-style-type: none"> • demonstrating knowledge resource in various approaches, • teaching the techniques of making use of codified knowledge, • searching for tacit knowledge. <p>This stage closes the basic range of the spiral of utilization of knowledge SPU. In the context of this spiral it is possible to move to the stage of administration (stage 19) or return to stage 1. This is also an event initiating the sub-process “Distribution via a system of training” in the process of processing knowledge.</p> |
| <p>19. (SPU) Administration of tools of providing access to knowledge</p> | <p>In this stage the conclusions from stages 6 and 9 concerning the techniques of access to knowledge are realized. This is also an event initiating the sub-process “Identification of the need of nurturing knowledge including archiving” in the process of processing knowledge.</p> |
| <p>20. (SPU) Administration of providing access to knowledge</p> | <p>In this stage the conclusions from stages 5, 6 and 9 concerning the right to knowledge are realized. This is also an event initiating the sub-process “Accepted knowledge” in the process of processing knowledge.</p> |
| <p>21. (SPC) Audit of the adequacy of the content/form/method/tools</p> | <p>In this stage an evaluation is undertaken and in the case of perceived deficiencies recommendations for improvement are formulated, regarding knowledge itself and the tools of utilizing it. This stage is realized only once in a while and in the framework of a clearly formalized process. This is also an event initiating the sub-process “Cyclical review of tasks” in the process of processing knowledge.</p> |

Table 2. The structure of the process of knowledge management (cont.)

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| <p>22. (SPC) Audit of the organizational efficiency of knowledge management</p> | <p>In this stage an evaluation is undertaken and in the case of perceived deficiencies recommendations for improvement are formulated, regarding the process of knowledge management itself, that is, in the organizational aspect and the study of effectiveness. This stage is realized only once in a while and in the framework of a clearly formalized process. This is also an event initiating the sub-process “Cyclical review of tasks” in the process of processing knowledge.</p> |
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The basic tasks of the owner of the process (for example, the proxy of the management board for knowledge management matters) are:

- coordinating and administering the realization of the process of knowledge management in the organization,
- preparation of annual reports from the realization of tasks related to knowledge management as well as the preparation of the plan of realization of tasks related to knowledge management for the next year,
- conducting audits of the realization of the process of knowledge management, submitting needs for tools or information (IT) systems that are to serve the realization of the process of knowledge management,
- planning long-term tasks in the field of knowledge management and presenting them to the management,
- designating the goals of actions of the managers of particular areas of knowledge,
- coordinating the relations between individual areas of knowledge and their managers,
- supervising the analysis of knowledge needs, manners of obtaining, storing and distributing knowledge,
- conducting mechanisms to inspire and collect ideas for the improving of the procurement of knowledge,
- submitting proposals to separate (make distinct) new areas of knowledge,
- submitting proposals to appoint managers of areas of knowledge, and

- submitting proposals to introduce changes in the process of knowledge management and in acts of internal law.

In analyzing actions in the process of knowledge management one can see that from the domain of the management of business processes questions are generated that reflect needs and the addressee becomes the spiral of perfecting knowledge. As a knowledge need resulting in a question about knowledge one should understand not only direct operational needs but also all kinds of the acquiring of knowledge “just in case”, for the perfecting of actions, raising of qualifications, becoming acquainted with market possibilities, technical advance, etc. One must have awareness that this domain is first and foremost a mechanism, which should effectively lead to the obtaining of knowledge by its targeted beneficiary. In an organizational and functional sense the source of essential knowledge can even be that same organizational cell that submitted the need for the information. For example, a group that is repairing a breakdown stated the discrepancy between the factual state of affairs and the documentation and is looking for a person who participated in the past in the construction of this fragment of infrastructure. Information about this person, as a source of tacit knowledge, will be supplied in the context of the process of knowledge management. As a consequence, this information should lead to the revealing of this knowledge (the knowledge will find itself in the possession of a larger group of persons) and then its codification (by supplementing the documentation).

7 Summation

The proposed structure of the process of the further processing of knowledge is based upon three spirals of actions. The organizational structure created for knowledge management deals with the two spirals: *the spiral of perfecting the collection of knowledge* and *the spiral of the perfecting of the formulation of knowledge*, the third - *the spiral of perfecting the utilization of knowledge* - is used to implement the business services provided to client. The activities cover the whole of the three spirals. The division into spirals due to the different organizational nature of the activities. Separation of each of the spiral is the implementation of the framework for the systematic improvement, which is after all the essence of art and the pursuit of wisdom. This corresponds to today's challenges - business and society based on knowledge.

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