

KNOWLEDGE MANAGEMENT STRATEGIES

DEZSŐ SZAKÁLY

PH.D., HEAD OF DEPARTMENT, UNIVERSITY LECTURER
UNIVERSITY OF MISKOLC, FACULTY OF ECONOMICS, INSTITUTE OF MANAGEMENT SCIENCES
DEPARTMENT OF INNOVATIONS AND TECHNOLOGY MANAGEMENT

SUMMARY

The article summarises the today recognisable, institutionalised knowledge management models by reviewing the basic problems of knowledge management. It shows the basic features, the focuses of examination, the effects of each tendency. Than the author gives models and a typological system to develop the knowledge management strategy.

1. THE BASIC PROBLEMS OF KNOWLEDGE MANAGEMENT

Knowledge management is the process of delivering

- the right knowledge,
- to right people,
- at the right time,
- with the right composition
- and the right degree of abstractness,

and the collection of activities to achieve this.

The key elements of the process are:

- integrating data, information and experience
- and the different levels of the organization.

The phases of the process that identify, develop, distribute and keep up-to-date the strategically significant knowledge of the enterprise, are of outstanding importance. This collection of activities cannot be operational, cannot be restricted only to the information needed at the very time but has to ensure the knowledge base for the stable functioning of a company. In order to acquire external knowledge is of overriding importance (acquisition and transfer).

Fundamental questions of knowledge management can be summerized by the following three approaches (Bellinger, 1999):

1.1. MECHANISTRIC APPROACH

It concentrates on the information and technical side of knowledge management. Its main elements are:

- Efforts to improve the quality of information processing
- Using network technologies in problem solving.
- Transferring documentary systems on information basis

According to this technocratic approach, support systems from external sources can be applied easily. Adopting ability is of a relatively high level. However, modernization, based on technical changes, does not always provide a higher level or wider share of knowledge than before.

1.2. Behaviour and Culture Oriented Approach

It is the learning processes of the company that are in the centre of thinking. The main aim is to increase innovation and creativity including the extension of explicit knowledge and transformation of experiences.

The key elements of this approach are:

- Cultural changes are accompanied by efforts to innovate knowledge, the conflicts of which the company should be prepared for.
- Traditional knowledge bases are no longer the sources of improving effectiveness, integrating new knowledge requires a change of behaviour of cooperators.
- Managers should force the fast knowledge distribution within the organization.
- The effects of cultural changes are hard to appraise, although they can be perceived through company development.

1.3. SYSTEM ORIENTED APPROACH

It concentrates on the problem solving process hidden behind the compulsions of changes and knowledge reception. This approach connects the tasks of knowledge renewal to products/services and technological systems.

Emphasized fields of examination are:

- Highlighting the solutions tied to the explicit knowledge of problem solving.
- Promoting complex task solutions.
- Technical changes cause the employees' knowledge to be altered. The main tasks of knowledge management can be designated with the implementation of changes.
- This approach includes a realistic access to the questions of knowledge management.

The effect chain of institutional knowledge management is laid down in 5 phases by Wiig (1999), who separates the tasks of:

- Creation and renewal knowledge
- collection of knowledge and its systematic retaining
- utilization
- spreading
- and continuous application.

Wiig designed the functional model of knowledge management based on this effect chain (see Figure 1), which integrates individual and institutional knowledge development.

The following tasks should be aimed at

- exploring and setting up,
- transformation and restructuring,
- distributing knowledge and information required within the company as well as with the customers and cooperators
- formalizing and preserving the acquired knowledge so that it should be suitable for creating knowledge based services,

so as to operate and continuously develop our business enterprise.

The conditions to establish the success of knowledge management shown on the model above are:

- Create the information and knowledge storage systems. Insure easy and fast access to knowledge available for the employees. Facilitate creative work and support individual and team initiatives.
- Create situations, when colleagues are able to use their accumulated knowledge and share with the others.
- Create an open, inspiring atmosphere for your employees
- Make your employees interested in creating values.

In a model developed by Gupta and Govindarjan (2000) seven main steps of knowledge collection and distribution are laid down (see Table 1).

Table 1
KNOWLEDGE COLLECTION AND DISTRIBUTION
BY GUPTA AND GOVINDARAJAN (2000)

PROCESS OF KNOWLEDGE MANAGEMENT	CRITICAL POINTS OF KNOWLEDGE MANAGEMENT
<i>1. Knowledge creating (internal sources)</i>	knowledge vacancy is not recognized lack of dreaming
<i>2. Knowledge acquisition (external sources)</i>	early recognition of external possibilities lack of integration and utilization
<i>3. Knowledge retention</i>	high fluctuation of white-collar employees sharing patented knowledge with competitors
<i>4. Knowledge identification</i>	selecting the best experience recognizing values
<i>5. Knowledge distribution</i>	jealousy and egoism on the senders' side the receivers' refusal
<i>6. Knowledge transfer</i>	selection of effective channels selection of effective methods
<i>7. Knowledge reception</i>	finding the searching field recognizing important knowledge

Functions of knowledge management

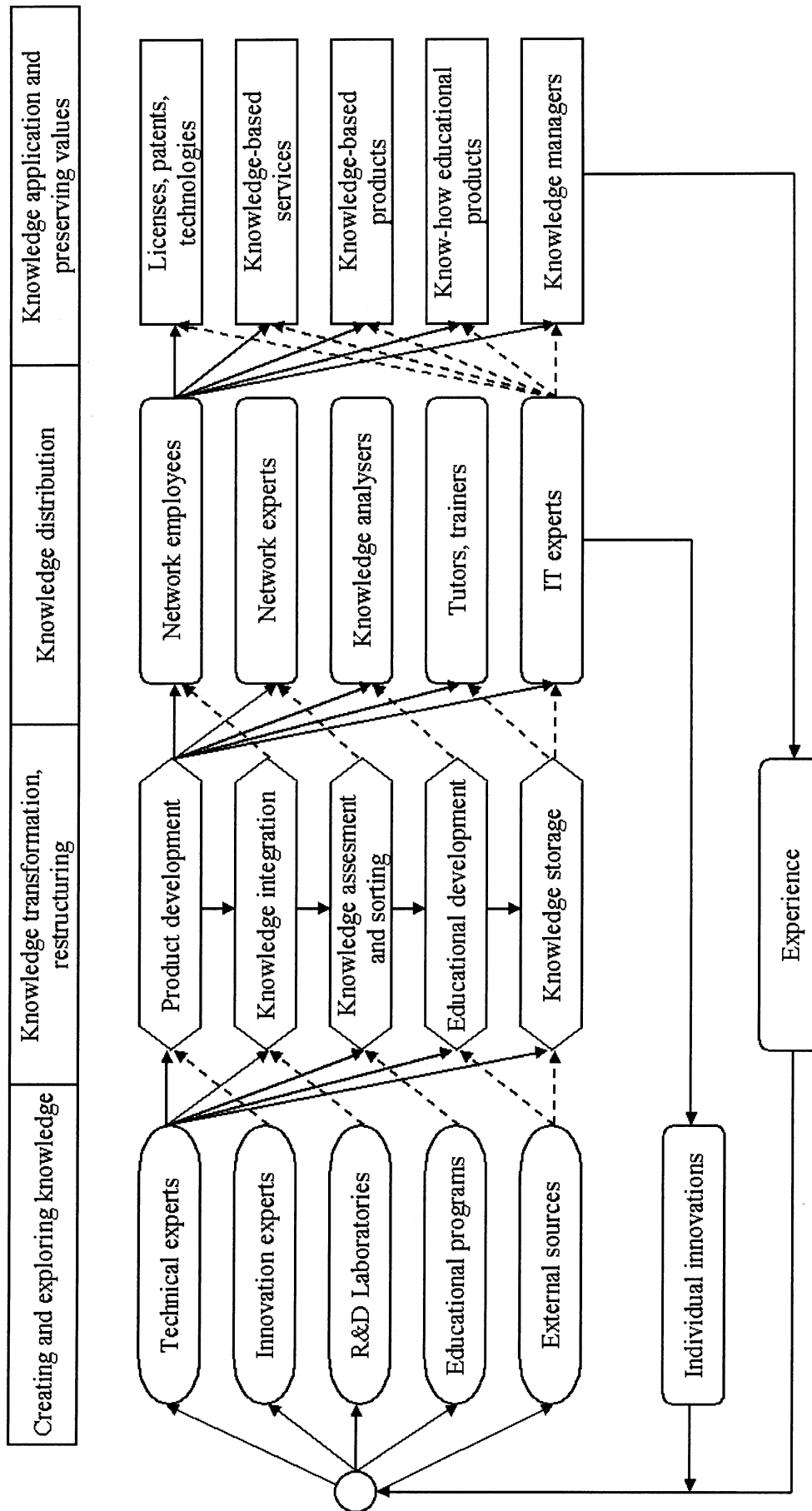


Figure 1
Transfer processes of knowledge (by Wiig, 1999)

Preconditions of good realization can be formulated phase by phase. The authors' recommendations are summarized below:

1. Knowledge creation:

- well-trained employees
- accurate and careful selection attached to goal task
- tolerant receptive medium
- effective individual encouragement
- continuous, full-scale education and further education
- achievement orientation

2. Knowledge acquisition:

- fast and early response to innovations
- institutional support of acquired innovation, fast development of know-how level knowledge
- placing employees next to knowledge sources
- accomplishment of technological effect-analysis in organized forms
- openness for receiving information

3. Knowledge retention:

- rewarding employees' loyalty
- installing knowledge bases

4. Knowledge identification:

- deliberate sifting of knowledge and information
- clear vision of future
- institutionalization of experience recording

5. Knowledge distribution:

- encouraging individuals
- ensuring exchange of experience
- measuring performance and analysing

6. Knowledge transfer:

- designing channels and methods suitable for different knowledge types
- establishing technical background

7. Knowledge reception:

- institutionalization of information exchange within the company

these cases know-how level knowledge can be obtained by means of explicit knowledge, which can also lead to developing a technological knowledge transfer business.

The sequence of ideas is true if reversed, too: Know-how level knowledge cannot be obtained without the systematic use of codification. Person-oriented strategy produces only a good network of experts, but does not automatically provide an institutionally tradeable package of knowledge.

c) Applied controlling system

It can range from classical linear controlling system through matrix organizations, to project-network systems.

d) Novelty protection of products or services

Protection can vary on a scale from open knowledge handling to strong protective systems.

As far the content, protection can include all kinds of transitions between legal exclusion and strategic cooperation.

e) Classification of applied knowledge: the ratio of open and tacit knowledge

Open knowledge is easy to code and store. Tacit knowledge is attached to a person, therefore storing is difficult and its transfer cannot be automated.

The 5 factors shown above can help to determine the company's starting strategy. This strategy, however needs to be audited from time to time.

Key fields of the audit are the following:

- change of expectations in business
- maturation of the product and service structures
- employees' maturation and personal development
- development of science, integration and acceptance of new knowledge
- change of IT technologies, new possibilities in knowledge storing and structuring (advisor systems)

2. KNOWLEDGE MANAGEMENT STRATEGY

Based on theoretical results several practical models have been developed and introduced to companies. The preparation of these actions demands to create knowledge management strategy of the company. As it is a special functional sub-strategy, it can be deduced from innovation and performance strategies. The possible issues orienting the creation of knowledge management strategies are as follows:

a) The standard or individual character of the product or service

Codified knowledge has a limited meaning in cases, when the company's products or services are adjusted to customer's individual expectations to a great extent.

b) The innovative or mature character of the product or service

Mature products or services provide a great number of opportunities for validating the codification strategy. In

3. CLASSIFICATION OF KNOWLEDGE MANAGEMENT MODELS

According to the observation of empirically recognized practical models, five typical knowledge controlling models can be distinguished (Hansen, 1999).

3.1 ROUTINE ORIENTED MODEL (COOMBS-HULL, 1999)

The model is based on formalization and a highly structured and hierarchical documentary system. To create and operate this model, codificational strategy is applied, whose main points are as follows:

- Knowledge is utilized independently of the original owner of the knowledge.
- Standard knowledge pieces are created (interview-standards, comparative databases, detailed working-method descriptions, etc.)

- Knowledge base is open to potential users.
- There is no direct contact between the creator and user of knowledge.
- Based on huge electronic data banks.
- It basically stimulates reproduction.
- It can be utilized by companies having to cope with similar problems several times.
- It supports cheap and fast problem solving.
- It strives to recycle a knowledge piece already created.
- With knowledge recycling it broadens the company's problem solving capacity.

Employees are differentiated and further educated according to their reproduction abilities. Systematically arranged knowledge pieces of advisor systems are often used. Levels of primary importance represented by:

- Technical reports
 - documents made as routine tasks
 - tied to the R&D's emphasized acts

- Revisionary reports

It makes possible to map the abilities and skills of organizations (or persons) participating in innovational actions, whereas knowledge inventory enables you to separate common and special knowledge from each other.

- R&D project's documents (teamwork documents)

It represents documentation of knowledge pieces and learned by team members and developed in teams existing for various length of time. Some parts of it can be considered as individual experience (team development), while other parts can be recognized as jointly created, accepted and inherited norms.

- Documents summarizing project experience

It means an official summary of the results achieved by a knowledge-based analysis of documents.

Central elements of routine oriented models are the so-called Knowledge Management Routines (KMR). KMRs are special routines of the organization, operating in innovative (changing) processes and affecting the intensity, size and direction of knowledge change. In order to be able to interpret and apply this concept, it is necessary to explore its main features. These features can be summarized in the following structure:

1. Phases of knowledge utilization
2. Types of knowledge
3. Performance of the organization
4. Level of formalization

Phases of knowledge utilization

In general 3 phases of knowledge utilization are identified. They are as follows: creating, transferring and utilizing knowledge. These phases have been descended from the analogy of information technology of processes. Special process elements are attached to the main phases, they can be recognized more easily. These can be the following:

- recognizing and separating the potentially useful knowledge
- catching and recording new knowledge pieces
- inserting new knowledge pieces into the transfer systems
- stabilizing isolated knowledge and having it stabilized
- inserting isolated knowledge into the environment, defining the conditions of its transfer

Types of knowledge

The main aim is to define the general and specific knowledge pieces, because their place of genesis and determination of the ideal direction of their transfer represent primary preconditions of utilizing knowledge.

Performance of the organization

The effect of knowledge on the performance of the organization can be measured by innovation-efficiency indexes. Output-side quality and quantity indexes are, of course, of key importance.

Level of formalization

The KMRs can be achieved at different levels of formalization. The information technology support for R&D and innovation projects are in direct proportion to the growth of the documentation level of knowledge retention and distribution. In routine-oriented models knowledge control enforces formalization in the first step followed by the emergence of R&D knowledge centres. The effective IT support for knowledge centers and R&D processes increase the efficiency of the model, due to the growing standard and completeness of documentation and the improving technical conditions of knowledge transfer.

Typical examples:

- complex, machine producing companies
- technology defined basic- and intermediate material producing companies

3.2 PROJECT-ORIENTED MODEL

The organizations and active teams of R&D accomplish a function method, which is in accordance to the structure of the matrix organization. The structural and coordinational points of intersections can be comprehended as the hot points of knowledge changing. During the functioning of the project these knowledge-accumulation points are always in motion.

Their documentation can be carried out at the time of their formation. The following elements of the so-called knowledge maps can be separated:

a) Internal technology maps

- They are used for representing marketable systematic knowledge pieces. These maps can be explored in practice with the so-called technological audit. In lack of deliberate explorations the maps come about as results of specialists' individual efforts.

- It is also important to record knowledge pieces that can be generalized besides individual (project or event-specialized) knowledge.

b) External technology maps

- They record relevant external knowledge sources and their content is regularly forwarded to internal users (expert's reports).

- The operation of this knowledge base is provided by a specialized establishment (company library, IT experts, external supplies) and modern technology (company Intranet).

c) Market knowledge map

- It is used for learning the customers' knowledge base
- It is of primary importance, when the customer's knowledge seems to be the weak point of renewal
 - either because the link with competence is too strong
 - or the expenses of change are too high

d) Inter-company knowledge map

- It is used to introduce knowledge chains derived from vertical links (basic material, spare parts, assembled end-products)
- The vertical steps of knowledge diffusion can be different force and controllability, whose objective and clear recognition may affect the role to be chosen (patent protection, rules of licence transfer, etc.)
- This map helps to clarify the fields of a future cooperation or its concrete forms of implementation for enterprises working together in a strategic alliance or preparing for a strategic alliance (Competence maps)
- Typical examples:
 - multinational companies producing consumer goods
 - secondary manufacturing companies

3.3 PERSON-ORIENTED MODEL

Having recognized and acknowledged that knowledge is linked to individuals, this model is about to spread the knowledge built upon personal ties within the company. The enforcement of this strategy is ensured by the following:

- regular organization of internal forums for knowledge spreading (workshops, internal conferences, informal panel discussions, internal information brochures, etc.);
- encouraging individuals to participate and share their opinion
- enhancing both vertical and horizontal communications
- handling personality with priority

Emphasized features:

This model focuses on the encouragement of sharing knowledge.

It is often used by knowledge-oriented companies, which aim at achieving the institutionalization of prominent individual knowledge. Their operation is highly facilitated by the so-called internal yellow pages (knowledge phonebooks), which represent the list of knowledge orientation possessed by the employees (acknowledgment, status, set of values, etc.). The model targets to recycle and integrate individual experience while utilizing novelty producing and value-increasing effect of individual solutions. Companies try to choose creative cooperators and encourage individual innovations. On training programs communication techniques are put into focus together with enhancing individual communication skills. Problems are solved in teamwork. The goal of IT support is to ensure employees' unlimited cooperation. During problem solving activities creative elements are trained, too. A wide network of experts is set up, while concrete tasks are accomplished by occasional teams. The model makes it possible to come up with specific solutions.

Typical examples:

- research institutes
- account offices
- lawyers firms
- software manufacturers

3.4 MODEL BASED ON INTELLECTUAL PROPERTY PROTECTION

The model deliberately aims at creating legally circumvallated (protected) knowledge. It is a tool for elaborating temporary innovation monopolies.

Artificial limits of entering a market can be set up with the help of controllers linked with knowledge transfer (economic, legal, technical).

Typical examples:

- pharmaceutical industry
- microelectronic spare parts producing

3.5 IT BASED MODEL

Activities linked to tasks of knowledge storing and diffusion are implemented by automated information networks based on IT. Virtualization can be pointed out in many phases of knowledge creation, which can cause new kind of problems in documentation and storage.

Typical examples:

- engineer offices
- prime-contractor or investment offices
- virtual offices

Companies tend to make recurrent mistakes in four fields of knowledge management (Achtenhagen, 1999):

- a) They cannot utilize properly knowledge pieces derived from market experience in innovational processes.
- b) Knowledge transfer between suppliers and different workplaces is not fast or effective enough.
- c) Spreading the best practical solutions deduced from the experience is not carried out.
- d) They fail to benefit from advantages coming from dispersed knowledge base built on networking.

These general problems can often be attributed to controlling inadequacy.

Companies should concentrate on four fields in controlling:

1. Rules

The boundaries of executing activities important for knowledge management can be made definite by creating clear rules. For example, the determination of the frequency of visits in customer-relationships or written recording of experience linked to prototypes. Creating these and similar rules enables you to utilize properly the knowledge accumulated within the company by explicit means in knowledge distribution processes.

2. Formalization and structuring

The acquired knowledge has to be spread through regular and official channels. In order to achieve it, collected knowledge pieces should be structured. This is generally accomplished in electronic based knowledge databanks.

3. Enframing person-to-person relationships

Tacit implicit knowledge of people can be moved to institutionalization by person-to-person relationships. All

these make it necessary to develop and create knowledge basically producing the initial conditions for interactions.

4. Building specific processes

Means the creation of the special processes of knowledge creation and knowledge utilization, including the framework of individual and collective learning possibilities.

The structuring of knowledge always features a critical point of knowledge management. This almost always involves extra load for participants (writing records, reports, defeating jealousy). It is practical to provide adequate stimulation for contributors in order to intensify knowledge transfer.

Practical learning and planned knowledge management results in the simultaneous change of three possession-elements – that have an effect on the knowledge possessions of the company:

a) Professional knowledge

Professional knowledge is summarized in equipment together with their operational methods. The clearly recognizable direction of progress is indicated by the intensified integration of professional knowledge. The open spread of knowledge built in equipment (CD law database, accounting programs, expert systems for diagnostics) enables innovating and manufacturing companies to spread their own company culture as well.

b) Experience – practice - routines

Routines are the summary of experience derived from practices and made into rules, guides, and other formalized form.

The experts of knowledge-oriented companies' having direct contact with customers get into privileged positions due to the routines they own.

It is not by chance that leading knowledge oriented

companies (software houses, account offices, auditors, etc.) make big efforts to

- record project-history
- evaluate the results of planning
- document event-history
- write user guides and work instructions
- make bibliographies
- collect and analyze statistic data.

Creating and transferring routines to other organizations may instabilize knowledge bases, because its spreading equals to obtaining small comparative advantages inherent in them.

c) Constitutional culture

As a result of learning culture-influencing factors also tend to change. The main manifestations of this change are the following:

- transformation of scale of values
- change of norm limits
- change of communal and co-operational rules
- routines are revalued

Every company is supposed to clarify their core competencies in terms of their future. Knowledge and skills classified into this category enable company to

- create products or services of great and special quality
- operate special market relationship-systems.

Company study-programs linked to the strategy should focus on acquiring and developing these competencies by enhancing their own internal learning processes (individual and organizational) and integrating external learning sources (buying knowledge, concluding alliances, etc.). The table shows the achievements of companies using knowledge management systems and developing successful methods (Table 2).

Table 2
KNOWLEDGE MANAGEMENT ACTIONS (BY SVEIBY, 1998)

FIELDS IN FOCUS		
Initiatives based on external sources	Initiatives based on internal sources	Utilizing new competencies
Utilizing knowledge acquired from customers	Enhancing knowledge-sharing	Creating knowledge management duties
	Developing and integrating new values	Instituting the knowledge transfer between individuals
Comparing external knowledge with customers' experience	Systematical recycling of individual knowledge	
	Assessing and evaluating knowledge possessions	Collecting knowledge through simulations and experiments
COMPANIES		
Benetton GE Ritz - Charlton Hotels Frito - Lay Skandia	3M Boeing Ford Motor Co. Hewlett Packard McKinsey BP	IBM Honda Xerox Matsushita

BIBLIOGRAPHY

- ACHTENHAGEN, L. – WAGNER, M. (1999): **Wissensmanagement in multinationalen Unternehmen**. IO-Management, Vol.68, No.3, pp.82-83
- BELLINGER, G. (1999): **Knowledge Management – Emerging Perspectives** <http://about.com>
- COOMBS, R. – HULL, R. (1998): **“Knowledge Management Practices” and Path Dependency in Innovation** Research Policy, Vol.27, No.3, pp.237-253
- GUPTA, A. K. – GOVINDARAJAN, V. (2000): **Knowledge Management’s Social Dimension: Lessons from Nucor Steel** Sloan Management Review, No.12, pp.71-80
- HANSEN, M. T. – NORHUA, N. – TIERNEY, T. (1999): **What’s Your Strategy for Managing Knowledge?** Harvard Business Review, Vol.77, No.2, pp.106-116
- SVEIBY, K. E. (1998): **What is Knowledge Management** <http://knowledgemanagement.com>
- WIIG, K. M. (1999): **What Future Knowledge Management Users May Expect** Journal of Knowledge Management, Vol.3, No.2, pp.155-165

Resümee

Dieser Artikel fasst die heutzutage erkennbaren institutionalisierten Knowledge Management Modelle durch ihre Grundprobleme zusammen. Sie stellt

- die Grundeigenschaften,*
- die Schwerpunkte der Analyse und*
- die Effektmechanismen*

der gewissen Methoden dar.

Dann gibt der Autor Modelle und ein typologisches System für die Ausbildung der Knowledge Management Strategie.

Összefoglaló

A cikk a tudásmenedzselés alapproblémáinak áttekintésén keresztül a napjainkban felismerhető intézményesült tudás menedzselési modelleket foglalja össze. Bemutatván az egyes irányzatok:

- alapjellemezőit,*
- vizsgálati súlypontjait*
- hatásmechanizmusait.*

A szerző ezután a tudásmenedzselési stratégia kialakításához ad modelleket és tipológiai rendszert.