



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI



Politechnika Wrocławska

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



ROZWÓJ POTENCJAŁU I OFERTY DYDAKTYCZNEJ POLITECHNIKI WROCŁAWSKIEJ

Wrocław University of Technology

Production Management

Stanisław Iżykowski, Dorota Sierżan

KNOWLEDGE MANAGEMENT

Wrocław 2011

Projekt współfinansowany ze środków Unii Europejskiej w ramach
Europejskiego Funduszu Społecznego

Wrocław University of Technology

Production Management

Stanisław Iżykowski, Dorota Sierżan

KNOWLEDGE MANAGEMENT

Wrocław 2011

Copyright © by Wrocław University of Technology
Wrocław 2011

Reviewer: Arkadiusz Kowalski

ISBN 978-83-62098-14-9

Published by PRINTPAP Łódź, www.printpap.pl

Table of contents

- Introduction.....4
- 1. Knowledge as a key resource in an organization.....6
 - 1.1. Enterprise development in knowledge based economy..... 6
 - 1.2. Knowledge definition and features..... 10
 - 1.3. Knowledge types in an enterprise..... 13
 - 1.4. Knowledge sources in an enterprise 18
- 2. Knowledge management.....21
 - 2.1. Knowledge management definition..... 21
 - 2.2. Objectives of knowledge management..... 26
 - 2.3. Knowledge management process 28
 - 2.3.1. Knowledge localization..... 30
 - 2.3.2. Knowledge elicitation..... 33
 - 2.3.3. Knowledge development..... 37
 - 2.3.4. Transferring of knowledge 42
 - 2.3.5. Usage of knowledge 49
 - 2.3.6. Uecurity and preservation of knowledge..... 51
- 3. Strategic approach to knowledge management..... 57
 - 3.1. Factors forcing knowledge management 57
 - 3.2. Startegies of knowledge management 58
 - 3.3. Models of knowledge management..... 65
 - 3.4. Chosen methods supporting knowledge management..... 70
 - 3.5. Measuring effectiveness of knowledge management and value
of knowledge 75
 - 3.6. Technologies supporting knowledge management..... 81
- 4. Implementation of knowledge management concept in small and medium
companies.....95
 - 4.1. Role of knowledge management in small and medium
enterprises 93
 - 4.2. Role of management board in a process of knowledge management
implementation 101
 - 4.3. Formation of organizational culture favoring sharing with knowledge 102
 - 4.4. Initiative of knowledge management implementation..... 104
 - 4.5. Benefits of knowledge management implementation..... 108
 - 4.6. Barriers of knowledge management 110
- Conclusions.....113
- Bibliography.....114

Introduction

Until recently, it was generally recognized, that about factors influencing a company's competitive advantage are its products, their quality, costs, price, using classical methods of management and organization. Currently, a growing number of entrepreneurs and managers think different. It is assumed that information and unique knowledge of people decide about the fate of the company – whether it will defeat the competition, survive, or be defeated. Times, when the quality of using „machines” and „resources” decided about the success of the company go slowly into oblivion. Knowledge decides about the success today – „knowing what”, „knowing how”, „knowing why”.

Knowledge management is a new paradigm of XXI century management. Giants of business world have understood already, that only the knowledge management determines which competitive position they will take in the next years. Sector of small and medium companies play a very important part in the Polish economy, that is their development is so important. What is crucial is that awareness of the benefits from the implementation of knowledge management should be increased in companies.

The aim of this elaboration is to present general rules of the Knowledge Management (KM) concept, rules of its design, and possibilities of its use in the processes of optimal decision-making. It also aims to demonstrate the most important benefits and barriers that impede the implementation process.

Each company is different, differently organized, has its market and its needs. That is why the capital of knowledge affects its functioning and development. Knowledge is a resource, which strongly impacts the position of the company in the market. That is why it is so important to appropriately understand knowledge terms, its types, features which characterize it and sources of its acquisition. The first part of the book (chapter 1) explains these issues.

Knowledge management is a modern, systemic concept based on effective use of knowledge resources of the company. It covers the whole process connected with acquiring, locating, creating, transferring, using and saving knowledge to realize objectives of the company. In particular it is purposeful to transform this knowledge in to a permanent value for clients, employees and people connected with the organization.

Without the knowledge management the position of the organization is threatened, especially regarding owned resources of knowledge and experience. Chapter two includes the basic information about this knowledge management topic, and also explains the basic processes, which are with it connected.

Knowledge management aims to achieve a return from long-term investments in intellectual capital of the organization. It is a system solution, which enables a radical growth by using the explicit effectiveness and tacit knowledge, causing that it will become a common knowledge of the whole organization.

Chapter three includes information about some of the knowledge management strategies. It also contains information about used tools and measures serving appraisal of an effectively implemented knowledge management system.

About the knowledge management we read and hear much more. This new philosophy of management is coming to Poland, slowly drawing attention of Polish managers of organizations. As a result we start to appreciate the potential, which results from conscious knowledge management.

The last part of the book shows what role in knowledge management plays Polish companies from the small and medium sector. It discusses factors, which have impact on the shape and perception of the concept, and indicates benefits coming from the knowledge management implementation and barriers which unenables, stops, or limits this process.

1. Knowledge as a key resource in an organization

1. 1. Enterprise development in knowledge based economy

We live in the world where the resources such as capital, ground, raw materials stopped to decide about the value of companies. For the company situation more and more impact have such an occurrence as continuously increasing information resources, growth of their details, and developing globalisation. More and more part in a current economy take organisations, which build their concurrence advantage based on immaterial resources like knowledge. The companies resign from specialisation, standardization and centralization for the benefit of diversity, flexibility and creativity. The investments made for intellectual capital, thanks which the company get identity, stability and ability to create and assimilate the technician-organisational progress very often are found more relevant than investments in ground, machines or buildings. In economy based on knowledge the conflict between work and capital has disappeared, which connect entirely. The owners of companies do not possess the tools of work, the workers are becoming the most important resource – knowledge. Estimations say that for few years 75 % of all work places in the countries very high developed will be connected with knowledge or information. The resources of knowledge, which have humanity, are growing according to the logarithmic function. To double the resources of knowledge since time when Gutenberg has discovered the printing press was need 300 years. Today doubling knowledge is a time of only 5 years. In the third quarter of XX century had been published the amount of books equal the numbers of books published in half millennium. In the developed countries, the amount of people hired in the sector of research and development is two times bigger than 30 years ago.

Saying about economy based on knowledge, at first its necessary to present the factors, which bring to emergence this occurrence, both as one of the science word and occurrence social-economical-political. Most often, the authors come to heuristic concept of Schumpeter innovations waves, which is related to the crucial inventions and development of their implementation. According to this, first wave started in 1785. And in last 60 years, second last 55 years, third- 50 years, fourth – 40 years, and fifth – current, based on digital networks, software and new media has to stay 30 years – till 2020 y [1].

Evolution of economy systems.

The first economy system – feudalism, because had not been earlier shaped economy at all, societies, there could not be talk about existing economy system. To describe the system in the II half of XX century can be used the expression “ market economy” and not capitalism, what reflects the change of society attitude to capitalism, which started to be identified - after Big Crisis – with mass unemployment and poverty. After II Word War (especially in 60 years) was put in the world the number of social solutions. In connection to that, has been come the significant leaving form the earliest concept of capitalism, based on liberality with small amount of social elements. To distinguish these two variants of capitalism: clean and having many social elements, the last from theme engaged to call “market economy”.

According to this one from the earliest definition GOW – authority OECD - economies based on knowledge are these, which directly base on production, distribution and using the knowledge and information. In 1999 y. OECD defined GOW as a collection industry advanced technology, such as: informatics and telecommunication and also sectors qualified man-power, such as: finance and education. The World Bank distinguishes so called four economy pillars based on knowledge. In author opinion in the best way, they describe the range GOW that are surrounding institutional-lawful, systems of innovations, information infrastructure (or development of teleinformatic), education and trainings (or the quality of work force). Today postulate the necessity of development continuing education, for exclusion to coming or deepening the knowledge divide, and improvement of education quality. One of the many ways of aiming at this what is using of e-learning tools.

The civilization changes found the mirror in politic economy in some countries. With respect to development of economy based on knowledge, the USA is a leader and the European Union since many years stay in the back under its influence. To level this distance it has been worked out the Lisbon Strategy and adopted in 200 y. has been put then for European Union the strategic aim: become in the continuously 10 years the most concurrence and dynamic economy based on knowledge in the world. Today is known, that this aim is going to be very hard to reach (if this is possible at all), because the level of productivity in UE-15 was about 20 % less than in USA and it would be very hard to make up this distance in 6 years, so the sense of realisation the strategy since not long ago was standing under question mark, till the time of the last summit the European Council in Brussels in march this year. The summit in Goteborg in 2001 y. has put the detailed aim implemented strategy: increasing level of expenses on researches and development to 3% PKB until 2010 y., from which 2/3 should be financed by private sector. Realisation of aim in some countries “old” UE will not be difficult, but e.g. in Poland it can be completely different. The level in years 1994-2001 rose by an average 0,7 % PKB (and only in 1994 y. it was more than 0,8 %), so the expenditures should be increased four times to reach this aim. Even with the Union funds it can be difficult to reach.

We can see that in spite of history challenges, despite of creating the economy based on knowledge is developing chance now, and necessity, to not give up for marginalization of country with regard to so-called “dividing knowledge”. The activities of Union politicians in this area can be seen as insufficient, what show the state of realization Lisbon Strategy. It is caused mainly by to high costs of work and lower (than in USA) innovations of companies.

The development of economy based on knowledge in Poland and other countries UE.

The position of Poland with regard to development of innovative systems, so i.a. interaction between universities and practices, among countries of system transformation, which joined to the UE, is not very bad (two countries - Latvia and Slovenia- marked worse results), and regard to education - the best (Fig. 1. 1). However, regard to development of information infrastructure only the situation of Lithuania was worse. Its connected in big measure with politic economy realized in Poland, especially tele-informatic politic, according to which- with regard to budget influence- the country let on domination one company in the market, what brings to the effective inhibition of concurrence development on the telecommunicate market and access to the internet, causing in effect keeping very high prise of access to the network. Implementation was also as a mistake– under the pressure of public opinion-zero rate VAT on the internet in current year, when it was sure, that was conflicting with Union law.

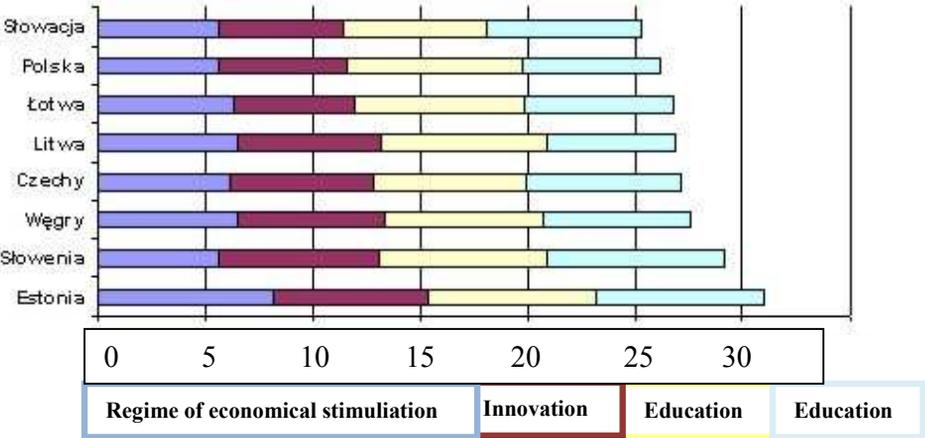


Fig 1.1. Pillars of economy based on knowledge in eight countries of system transformation

The low value of ratio development infrastructure information caused that with regard to ratio of Knowledge Economy, elaborated by World Bank Institute, as

an average arithmetic fourth pillars GOW, from among above. Countries Poland took up next to last place, overtaking Slovenia.

However modifying above methodology, allowing the weight of particular pillars in creating GOW, following by this example USA economy, author received the following results (Fig. 1. 2.).

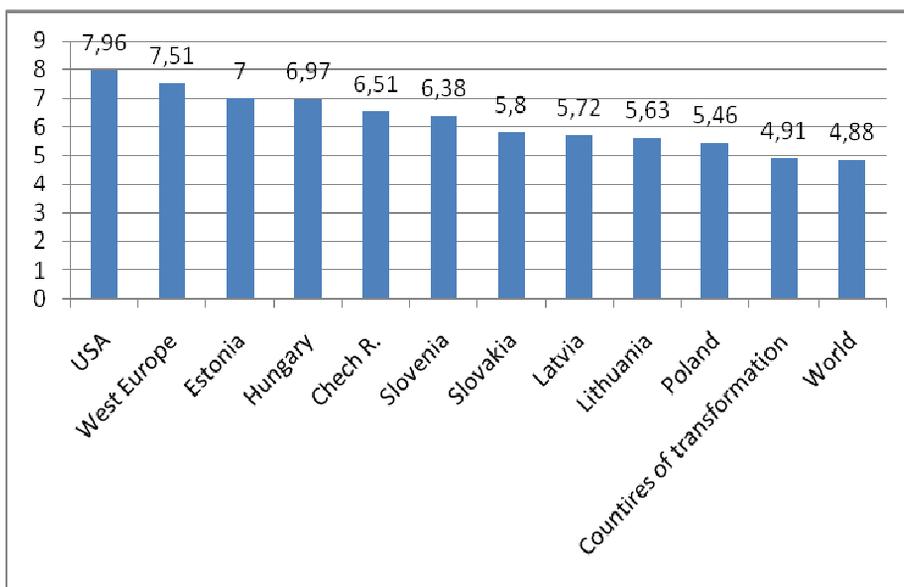


Fig. 1. 2. The development of economy based on knowledge in chosen countries of system transformation in comparison to other, chosen countries and their groups (W. Piech: *Knowledge and innovation processes in Central and East European economies*. 2004, s. 44)

It turned out, that with such methodology Poland with regard to development based on knowledge take the last place among eight countries of system transformation, which came to the European Union. Until quiet few years ago, talking about economy based on knowledge in Poland it has met with big misunderstanding. There was opinion, that it is an idea reserved only for the science environment. The activity popularised by prof. A. Kulkliński, under whose redaction was published few books, available also in the foreign markets, many aspects form these issues, does not speak to the polish politicians. The situation started to change in the last year, together with popularization the concept of Lisbon Strategy and preparing Poland to entry the European Union, what of course is connected with the necessity of politic economy adaptation to the aims of strategy. It came to this, that today we can say straight about “fashion” in discussing about topic economy based on knowledge.

1. 2. Knowledge definition and features

The resources of knowledge can quite conventionally share on: material, immaterial and human resources. The classification is presented on the figure 1. 3. The material resources are relatively easy to identify. It does not cause bigger problems counting the cash at the cash - desk, means in the bank account, devices and machines, or free stock area. However, the real advantage on the concurrence gives usually difficult to measure immaterial resources such as knowledge, mark or reputation of company. One of the difficulties, which meet organisation next to the implementation of knowledge, is explanation for the workers, how the knowledge has to be understood and management of knowledge.

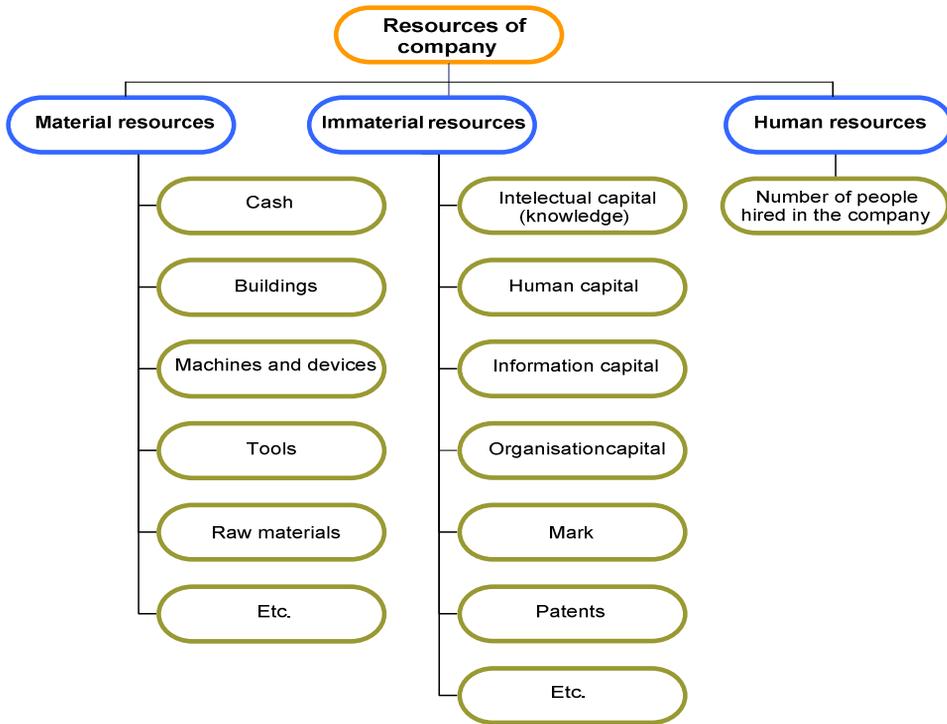


Fig .1. 3. Kinds of company resources (own elaboration)

The knowledge is a very complicated notion. Many known philosophers were thinking on his explanation already in the ancient times, even Aristotelian and Platoon and in further time Descartes. As opposed to other resources, knowledge cannot be touched and seen, so very often it is ranked to the immaterial list or different to

invisible. The knowledge can be included in different kind of documents, but more of its part is hidden in human brain. The value of knowledge in big case depends on situation, what means that we know this is what we want to know not as long as this is for us needful. There is existing accordance, to this, what is knowledge, many definition describing this notion has emerged. Usually they complement one with another, sometimes can also exclude [2]. Here are some of them:

- The knowledge is „(...) *fluid composition of oriented experience, value of useful information and specialist look, causing basements to mark and adopt new experiences and information. The knowledge arises and yields in human brains. In the organizations it's saved very often not ONZ In the documents and data base but also in the simple norms and procedures*” [41],
- “*Knowledge is using information in practice*”[21],
- “*Knowledge is a full using of information and data connected with human skills potential, possibilities of ideas, engagement and motivation*”[21],
- “*The wisdom is a combination of intuition and experience*”[21].
- “*The knowledge is information, which value has been proved at practice (tested in researches). This makes it different from the other unproved kinds of information, such as the opinion, speculations or believes* ”[20].

Very often the term of knowledge management is connected with the notion: data, information, knowledge and thinking. The dependencies between theme are introduced on the fig. 1. 4.

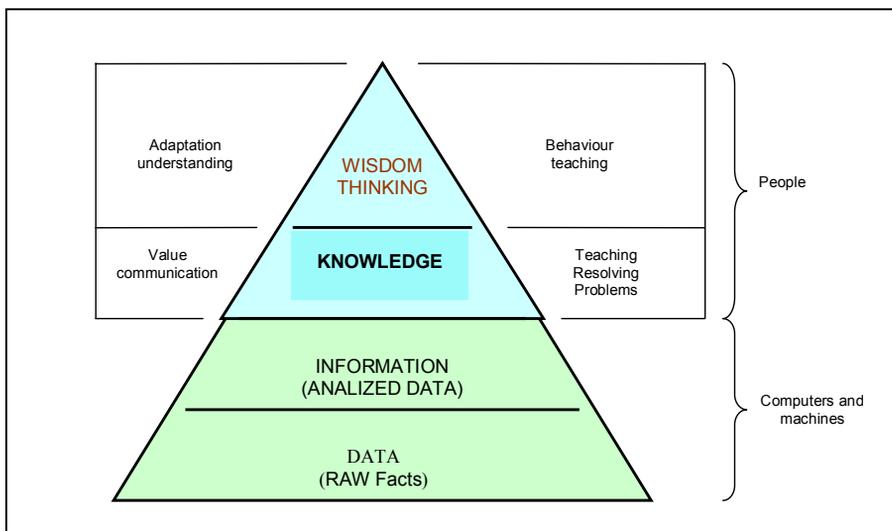


Fig. 1. 4. Hierarchy of knowledge (W. Grudzewski: *Zarządzanie wiedzą w przedsiębiorstwach*. 2004 s. 73)

Data are the elements of information. They are individual arising facts concerning some events, in organizational context they have to be understood as a formalized record of done transactions. Data are raw, not given to analyze facts, numbers and events on basis which is possible to elaborate information. For the practical work of organization such a raw, unfinished data have no bigger meaning. The process of data management rely on analysis and selection made from point of view: costs of it acquiring, rapidity (the amount of time passing from any occurred facts to it formal registration), and also quality (the grade in which they are needful next to making decisions). The growing level of technology and computing of companies to a high degree makes the process of data management easier and faster, but this is dangerous for collecting to much useless data [21].

The information has to be understood as an important factor, which cause that people and automatic devices work operationally and intentionally. Information is an ordered data, which can contribute to making decision. Information arises as a result of dividing, selection, data classification to use theme in specific aim. The basic feature which distinguish information from data is a part in changing way in which the receiver see some things, occurrence, came to being facts and impact on its behavior and verdict. The connection of information with current knowledge enables to get new knowledge in the organization [21].

The knowledge connects inseparably with person or owner of institution, whereas information can exist independently (e.g. as a document). Knowledge has always the human dimension. It always based on information, human intuition experience and understanding. In organizations it contained often in documents, procedures, processes, practices and norms. The status of knowledge is very often one of the main factors showing the concurrence advantage of company [21].

Devenport and Prusak, main theorist of knowledge management highlight, believes that knowledge is something different than information. Information is becoming the knowledge, when one of the mentioned types of analyze below will be done [21]:

- Comparison- how information about current situation relate to other information,
- Results - how the information influence on making decisions and actions,
- Connectivity – which connectivity exist between given information and the rest of information,
- Dialog- what is the opinion of other people on the topic of given information (in this activity is highlighted the meaning of contact between people in generating knowledge).

The wisdom is ability, also ability of people and organization to create and acquire knowledge and also learning thanks competent data transformation and information between people and organization. Whereas can be easy defined movement from data in information describing the process of transforming information in knowledge and wisdom result in more difficulties [21].

The borders between data, information and knowledge can not be established in precise way. Transformation data in information, and those as sequence in fluid way (continuous not jumping) what's presented on the fig. 1. 5.

Data	Information	Knowledge
disordered-----		ordered
insular -----		complex
Regardless of context -----		depending on context
Regardless of person using it -----		depending on person using it
reflected in a signs of knowledge-----		reflected in a proceeding model
analytical -----		synthetic

Fig. 1. 5. Features of data, information and knowledge (E. Głuszek: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. 2004 s.72)

Features of knowledge

Alvin Toffler specified the four characteristic features distinguished knowledge from the other traditional resources:

- Domination – knowledge has main place among the other resources, it has the strategic meaning for working in each company
- Exhaustlessness – it means that the value of knowledge resources is not decreasing when hand is over. The experts and specialist developing the creative abilities, skills of employees suggest that after done work, handed over knowledge in spite of “selling” stay not only at service, but also stay probably developed of new elements wined in a process of learning.
- Simultaneous - knowledge can be at the same time used by many people, in many places. Having knowledge we don't have right to it exclusiveness unless are composed of it patents, usable, formulas, etc.
- Nonlinearity – lack of unequivocal correlation between the quantity of knowledge resources and benefits result from this fact. Having a large knowledge, resources don't decide directly about concurrence advantage and don't guarantee interchangeably about advantage over company having limited knowledge, but in practice such as advantage reach.

1. 3. Knowledge types in an enterprise

Knowledge can be classified on many ways. The basic classification divides it on practical knowledge resulting from experience and theoretical resulting from reflection and abstract thinking to the point of this experience [20].

The most often and the most liked quoted classification divide it according to the basic features on: formal knowledge (explicit) and tacit knowledge.

Explicit knowledge is codified, and:

- can be precisely and formally articulated
- is easy to codify, document, transfer, share, and communicate

Tacit knowledge is generally described as [42]:

- subconsciously understood or applied
- difficult to articulate
- developed from direct action and experience
- shared through conversation, story-telling etc.

Explicit knowledge is easy to transfer, to learn and include historical data, formulas, and facts and so on. Tacit knowledge is difficult to transfer, hard to learn and complex. But know-how knowledge is one of the biggest advantages at all because “the how” enables an organization to learn, adapt and grow. While explicit knowledge is easy to imitate, tacit knowledge is a lasting competitive advantage. Toyota has several ways to collect and apply tacit knowledge to become a learning organization shown on figure. Most companies focus on explicit knowledge, defined above as easily codified, transferred without significant loss of integrity, and generally stored as facts, axiomatic propositions, or symbols. Historical dates, mathematical equations, and formulas fall into this category. Explicit knowledge is sometimes referred to as “know what” knowledge. It is characterized by voluminous databases. By contrast, tacit knowledge is complex, “sticky”, and difficult to transfer. Sharing tacit knowledge requires intricate ties between participants, it longer entails, deeper relationships, such as those that develop between a master craftsman and his apprentice. In fact, the apprenticeship tradition was designed as a means to transfer tacit “know-how” knowledge from master to student. Dyer and Nobeoka (1998) suggest that tacit knowledge holds the most competitive potential for companies even though it is difficult to learn (you can not merely imitate it), manage, and apply. Because it makes effective organizational learning difficult, many companies prefer to focus on explicit knowledge, which can be more easily gathered and stored. The big problem with explicit knowledge is that it can also be imitated. If one company can create an extensive database of explicit knowledge, so can a competing company, and this dilutes the competitive advantage of both [3]. One of the main reasons that companies fail at imitating lean systems is that they mistakenly copy only the explicit knowledge of lean tools and techniques. By and large these companies attempt to implement lean without understanding the need to tap into the tacit knowledge of lean culture, the know-how knowledge that enables organization to learn organically, adapt, and grow. They fail to grasp that in highly technical environments, such as product development, tacit knowledge is the true source of competitive advantage.

One important study on automotive product development supports this assertion (Hann, 1999). The study revealed that die tryout knowledge is highly tacit,

tends to be part in specific, and is very difficult to master. The author of the study also found that specialization, strong work routines, and continuous work fostered a significant reduction in time to complete die tryouts. In combination, these findings loosely define the power of effective lean learning (*The Toyota product development system* - James M. Morgan, Jeffrey K. Like, 2006).

In a table 1.1 are compared basic features of two knowledge types.

Table 1.1. Comparison of explicit and tacit knowledge (A. Pawluczuk: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004 s. 17)

<u><i>Explicit knowledge</i></u>	<u><i>Tacit knowledge</i></u>
<ul style="list-style-type: none"> - Objective - It comes from national thinking - Sequential character (there and then) - Theory - Easy to transfer 	<ul style="list-style-type: none"> - Subjective - It comes from experience - Simultaneous character (here and now) - Practice - Difficult to copy and to transfer

Two types of knowledge: explicit and tacit, also individual and social helped to highlight four kinds of knowledge. This classification is shown on the fig. 1.6.

	Individual	Social
Explicit	cognitive	objectified
Tacit	automatic	collective

Fig. 1. 6. Different types of knowledge in the organization (E. Głuszek: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. 2004 s.75)

Cognitive knowledge – individual explicit knowledge is people knowledge, about facts, concepts, and theories. It is stored in a memory or personal notes. Automatic knowledge so the explicit individual knowledge is habits, skills, practice gathered in brain. The objected knowledge or different social tacit knowledge it scope range the resources of knowledge common for employees included in instructions, announcements, clues and standards, etc.

Collective knowledge is social tacit knowledge. It contains in itself different kinds of social and institutional practice and experiences of work. On the figures are no visible relations occurring between different types of knowledge, have been presented only in clean forms. In reality in the enterprise we can meet with complicated mix of all knowledge types [20].

Different types of knowledge have dissimilar value for the enterprise. In the literature concerning knowledge management few important issues can be met, which in fundamental way influence on the grade of it using, in enterprise to make value. These are: transferability, ability to aggregation and appropriation [20]. In an enterprise the most important is transferability so the ability to transfer knowledge between employees and organization subjects determined by the degree of expressing knowledge. The difference between explicit knowledge and tacit knowledge is exactly in transferability and mechanisms which let to transfer it between people, space and in time. Explicit knowledge is delivered by communication. In this grasp it is treat as a common property, which after making can be used by no limited number of users, nearly for the zero costs. The tacit knowledge is getting disclosed by its using and the same can not be transfer in coded form. Because this type of knowledge can be observed only during it using, and the science takes place through practice, it prevalence between people takes place through long time and its very expensive [20].

The ability to knowledge aggregation partly determines efficiency of it effectiveness transmission. The transfer of knowledge consist of both it prevalence and it receiving. But this second depends to a high degree on ability of assimilating this knowledge by receiver. Because the ability to assimilate knowledge relay on adding new to already existed, the mean is becoming important, next to something what it using will be the remittance. As an example of useful transfer and aggregation some of the types of expressible knowledge can be served statistic. The ability to transfer and knowledge aggregation has important impact at location of authority to making decisions inside organization [20]. Appropriation must be here understood as an ability of resource owner to keep profit made by this resource. What about resources knowledge, they make many problems connected with appropriation issue. If we meet the inexpressible knowledge its difficult to talk about approbation, because it can not be passed directly. What about knowledge possible to express. Exist two problems. First: everyone who comes to posses it can without any obstacles resell it, and not loose it. Second: just acting itself of knowledge, e.g. marketing make it resource available for all potential customers. That's why the knowledge doesn't present the product, in which possessing can come in by doing the market deal (it doesn't concern the knowledge includes patents and authority lows). Because of ambiguous rights of property it's difficult to establish who the owner of knowledge is. Exist also four categories on which we can divide knowledge. Those are [21]:

- type of knowledge know-how (know “what”),
- type of knowledge know-why (know “why”),
- type of knowledge know-how (know “how”),
- type of knowledge know-who (know “who”).

The knowledge know- what refer to the knowledge about facts, e.g. how many students study on Wroclaw University of Technology, from which elements,

components is car build, when was build the Palace of Culture and Science in Warsaw. etc. knowledge of this kind is easy to put in words and save in a form of signs and numbers. Its meaning is a synonymous information. So it can be facilitated for people who are interested by computer network by means of e-mail, notes or another available way.

Knowledge know-how is a knowledge, which explains reality. Refer to the rules governing in the nature, in a human sociality, to the rights from physic area, chemistry, thermodynamic, etc. it is a kind of knowledge playing very big role in some of the science fields, e.g. in medicine, material industry, chemistry, electronically, automation with regard to speeding up the technician progress and also going down the possibilities of occurring mistake at making experiments.

Knowledge know-how refers to ability following people and teams for realization of concrete activities and tasks. Particularly it concerns competence employees, process of creating new product or recruit methods. Additional apart from physical meaning know “how” its coming here need to creating new knowledge by scientists, inventors, teams of workers making researches. It’s a resource hidden in human brains and in its composition come the experience flowing out from area. “I know how it’s working and how to do it. “ To this type of knowledge we refer when we make decisions and when we solve the more difficult problems is however to translate on language of signs [4].

The large decks of specialist knowledge lie in decks of human brain that’s why the knowledge know-who let on describing who posses knowledge from given field, who is specialist in given field, what is the range of knowledge and which are its abilities needful to transfer knowledge. It concerns the inside organization and also its surrounding.

Knowledge classification

W. Flakiewicz presents a bit different classification of human knowledge, single out four criteria of dividing [24]:

1. Diversity criteria
 - factografic knowledge – based on facts,
 - procedural knowledge – algorithimical, heuristic,
 - semantic knowledge – based on meaning times and words,
 - normative knowledge – describing norms and standards,
 - structural knowledge – concerning the structure of occurrence.
2. Generality criteria
 - Theoretical knowledge – build on the basis of statements, theories, etc.
 - Empirical knowledge – based on observation and experience,
 - Steering knowledge – being synthesis of theoretical knowledge and empirical,

3. Diversity criteria
 - Certain knowledge – based on facts and proved rights,
 - Uncertain knowledge – only partial confirmed by facts and rights,
 - Hypothetical knowledge – based on assumptions
 - Unawareness – whole lack of knowledge in given field,
4. Oncoming degree to given field criteria
 - Specific knowledge – directly connected with given field,
 - Abstract knowledge – model, general,
 - Interdisciplinary knowledge – using connection many knowledge fields to describing and analyze of occurrence.

1. 4. Knowledge sources in an enterprise

We are not able to capture whole knowledge, but we must know where to search information which is interesting for us. Currently ability of enterprise to assimilate new knowledge is one of the main factors determined about the success of company. For the process of assimilating new knowledge by enterprise the biggest impact has orientation of employees on learning and their openness on new concepts, possibilities, trends and information. In a large measure learning of organization relay on learning it employees with connection of skills to verify and use correctly gained knowledge and experience [43].

As a result of studies six measurements of gathering process knowledge have been revealed [43]:

1. Using external resources of knowledge,
2. Using of interior knowledge organization,
3. Cooperating companies establish the resource of knowledge,
4. Internet discussions,
5. Internet and intranet,
6. Trainings and consulting.

The process of acquiring knowledge form external resources relay on collecting knowledge from surrounding enterprise. It permits on becoming acquainted workers with new notions, concepts, standards and even culture of work. The internal organizational knowledge refers to the processes of communication, so not only the exchange of information, but also discussion, construction of opinion and making decisions. The role which fulfills this kind of knowledge can be seen in propagation inside the organization; its utilization and next verification reached by it help results. The first measurement is responsible for acquiring knowledge from surrounding, the second is responsible for it broad and effective using. The cooperation with companies enables acquiring specific knowledge with high degree of utilization.

Table 1.2 Directions of improving the organization ability to adaptation new knowledge
(L. Panasiewicz: *Źródła wiedzy i informacji*. *Ekonomika i Organizacja Przedsiębiorstw*. Nr 9/2005)

Factor	Possible solutions with the object of improving practice sphere
Availability of information	<p>Admit the rights to shape own informational environment by: popularization means of electronically storage data, particular solutions type e-paper, trainings of workers in a scope of information management and documents.</p> <p>Granting the access rights to this information, to which workers can, not only must to have access.</p>
Projected approach	<p>The widest engagement of employees in activities with projected character. Such projects can be linked with implementation new solutions. It is about: participation of employee in all sequenced phases of project realization – since beginning till the finish work within the framework of project team.</p>
Recognition of technical progress	<p>Formation accepted practice of new technical solutions.</p> <p>Tendency to receiving specified technical solutions or technological as a identity element of company should be eliminated. Identity of techniques or technologies with company result, that the reaction on changes assumes defended character, concentrated on actual behavior <i>status quo</i>.</p>
Internal motivation	<p>Movement of personal orientation strategy from model sita to model „human capital”.</p> <p>Stronger acceptance in period’s discussions of thread plans and developed programs of vacancies employees’ progress.</p> <p>Capacitance the participation employees in forming training politic (e.g. through capacitance employees choosing the topics of trainings).</p>

It comes however from outside of the organization. The fourth and fifth measurement enable estimate the using of a large potential which in a scope of receiving and converting information and knowledge offers Internet. These three measurements (3-5) are called feature. Contemporary market forces the skill of acquiring knowledge from cooperating companies. The trainings and consulting are very well known resources in making the sixth measurement. Describing the knowledge resources it's important to mention about factors having impact on the degree of using [43]:

- Availability of information- scope of information and knowledge should be bigger than it was resulting from work done and settled tasks
- Projected approach- not big work satiation by routine tasks and arrangements of workers in realization of complex projects result in a change of tasks scope depending on phase or nature of enterprise.
- Recognition for technical progress- if the technical progress is recognized for the chance for enterprise then is actively implemented. The effect used for adaptation news is instability in a scope of used technology.
- Internal motivation- inspiration of workers to vocational progress, impact on their internal motivation. It has to be inspired by other factors than e.g. planning the change of place or professional specialization.

Introduced factors have a big impact on the ability level of enterprise to use from available knowledge resources. In the table 1.2 are presented few exemplar solutions which are able to influence with benefit on the degree of usage available knowledge resources and the same on the enterprise ability to assimilate new knowledge.

2. Knowledge management

2. 1. Knowledge management definition

Contemporary world poses before the companies more and more new challenges. To rise to these companies have to continuously develop and improve. Its continuously process and independent of the economic level world progress, in which the company exist.

Decided meanings play here [21]:

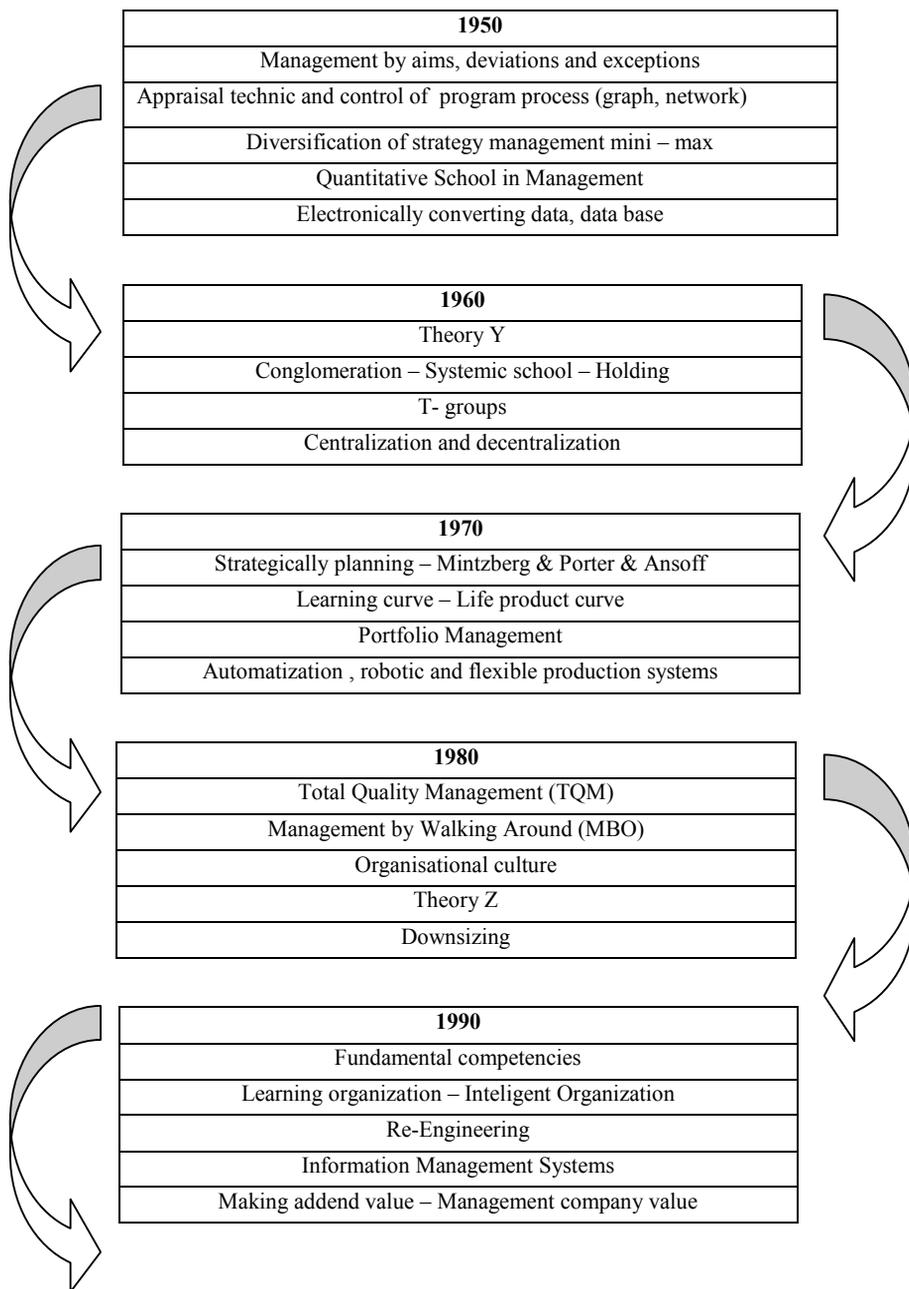
- Occurrence of world economy globalisation, manifesting itself by domination international companies, which in searching new markets for its products and cheaper workforce much preferably invest today in countries, in which economy is less developed, than it had place 10-15 years ago.
- Occurrence “technological jumps”, which cause, that companies learn on mistakes of other, and because of that jump to the newest technologies and reach acceleration of their development.

Nowadays rapidly and effectively using of knowledge very often decides about „to be or not to be“for many companies. The opinion of many experts from management department is, that the only one activity having for purpose integration of companies is their grouping on companies, which in own activities use knowledge (knowledge intensive), and also for these, which base on it.

As a beginning of knowledge management concept assume year 1987, in which in United States was first conference, entitled: „Managing the knowledge assets into 21st century” organized by University Purdue and DEC Company. In Sweden however set s.c. Conrad Group, which initiated work on “management of intellectual capital” [21].

Knowledge management in sciences about management become as a new concept staying not however apart from other, which were before, presented and implemented to the economy praxis. Is presented in table 2.1.

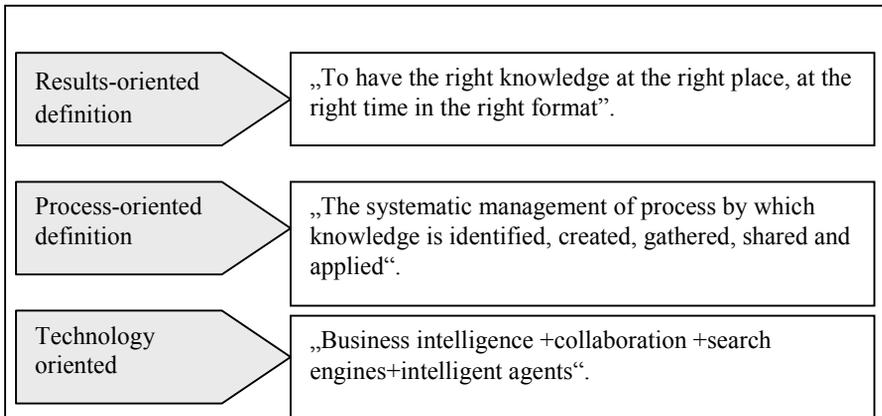
Table 2.1. Formatting concept of knowledge management (W. Grudzewski: *Zarządzanie wiedzą w przedsiębiorstwach* 2004, s.72)



2000
<u>Management knowledge</u>
Intellectual capital
Integrated companies (MRP i ERP) CIM
The culture promote transfer knowledge

There is no universally accepted definition of knowledge management. But there are numerous definitions proffered by experts. Saying very simply, knowledge management is the conversion of tacit knowledge into explicit knowledge and sharing it within the organization. Saying it more technically and accurately, knowledge management is the process through which organizations generate value from their intellectual and knowledge based assets. Defined in this manner, it becomes apparent that knowledge management is concerned with the process of identifying, acquiring, distributing and maintaining knowledge that is essential to the organization.

Table 2. 2. What is KM? (Benjamins V.R.: Knowledge Management in Knowledge-Intensive Organizations. Intelligent Software Components. 2001)



If one considers knowledge management in the broadest context, then there are multifarious definitions of knowledge management. All these definitions hint at the same idea but each one focuses on a particular aspect of knowledge management (Table 2.2). For example, a results-oriented definition may state that knowledge management is “to have the right knowledge at the right place, at the right time in the right format.” On the other hand, a results-oriented definition “To have the right knowledge at the right place, at the right time in the right format.” “The systematic

management of process by which knowledge is identified, created, gathered, shared and applied.” “Business intelligence + collaboration + search engines + intelligent agents.” Process-oriented definition Technology oriented process-oriented definition may describe knowledge management as “the systematic management of processes by which knowledge is identified, created, gathered, shared and applied.” And a technology-oriented definition may present a formula for knowledge management as “business intelligence + collaboration + search engines + intelligent agents.”

Aspects of Knowledge Management

There are two main aspects of knowledge management, namely, information management and people management. Viewed from this perspective, knowledge management is about information, on one hand, and people, on the other. Most entrepreneurs and managers are familiar with the term information management. This term is associated with the management of knowledge related to objects that are identified and handled by information systems. The practice of information management developed and became widely accepted when executives realized that information was an important corporate resource that could and should be managed to improve the company’s competitiveness. As a consequence of the growth in the practice of information management, the concepts of “information analysis” and “information planning” developed, thus providing additional tools for practitioners. As academics and theorists continue to reflect on the subject, information management has further developed into knowledge management. Entrepreneurs and managers have become more aware that knowledge – as differentiated from mere information – is an even more valuable resource of the organization. Consequently, the idea that processes or knowledge management must be developed in a manner similar to the management processes applied to information has gained more and more followers. This trend has resulted in a number of techniques being developed and applied such as “knowledge technology”, which analyzes knowledge sources. By using these techniques, organizations are able to implement “knowledge analysis” and “knowledge plan” – in much the same manner as the application of earlier tools of “information analysis” and “information planning”.

In practice, knowledge management involves, among others, the identification and mapping of intellectual assets within an organization. This basically means identifying who knows what within the company. When viewed from this perspective, knowledge management can be considered as a process of performing an audit of intellectual assets focusing on the organization’s unique resources and their crucial functions. Through this audit process intelligence, value and flexibility are added to the identified intellectual assets. In addition, the

Intellectual assets are protected from dormancy thus making possible significant improvements in decision-making processes as well as in services and

products. But knowledge management goes beyond this level of mapping. More substantively, it also involves the creation of knowledge for competitive advantage and the conversion of large amounts of organizational data into readily accessible information. Through knowledge management latent points of congestion that hinders the flow of knowledge towards decision and action can be identified. And with the application of ICT, all the different aspects of knowledge management can function in a seamless and coordinated manner. In fact it has been shown again and again that when knowledge is managed well, there is significant reduction in the time needed to complete tasks and unnecessary duplication is greatly minimized, if not avoided. The second aspect of knowledge management is people management. Basically, this involves the management of tacit knowledge that resides inside the heads of people. In actual practice it entails managing knowledge that exists alongside organizational processes involving a complex set of dynamic skills, know-how and other knowledge-related capabilities. In order to effectively manage the people that possess the desired tacit knowledge, it is essential to take into consideration their cultural and social values, attitudes and aspirations, and likes and dislikes. If this can be done successfully, it can lead to the creation of new knowledge that otherwise cannot be accomplished by information management alone. Although the importance of the two aspects of knowledge management is now well-recognized by many organizations, the full potential of knowledge management still remains to be realized. In fact not all organizations with some form of knowledge management systems in place are aware that they have such systems. Most organizations have some kind of system for the management of explicit knowledge, whether simple or complex. However, they may not necessarily call it a knowledge management system. On the other hand, the management of tacit knowledge is not common and the current technology based knowledge management has not developed a fully effective means for the extraction of tacit knowledge. Although tacit knowledge is at the core of organizational knowledge, it is so personal in nature that it is difficult to formalize and communicate. Both aspects of knowledge management embody two immediate Concerns:

- (a) to make organizational knowledge more productive; and
- (b) to produce benefits that are significantly greater than those envisioned.

Knowledge management offers an excellent opportunity to adopt previously impossible business strategies. For example, it can open the door to the creation of an almost unlimited network that enhances the alliances and relationships with customers and suppliers. In enhancing customer relations, knowledge management makes possible the discovery of new issues and opportunities through the optimum use of knowledge assets such as contract sales and records and customer demographics and data, including customer location and contact names. It is precisely in this manner that knowledge management can complement and enhance the impact of other initiatives of the organization such as total quality management, business process re-engineering, and organizational learning. It is evident from this discussion that knowledge

management initiatives can be applied in a variety of domains to achieve superior results within almost any type of organization. And it is possible to achieve these results regardless of the level of technological availability or the market sector concerned.

2. 2. Objectives of Knowledge Management

Development of new techniques and technologies cause that the knowledge day after day is losing its timelines. This determined yesterday about advantage on other companies, today can be not enough to compete with them. That is why the intellectual resources require stable surveillance and regular observation and actualization. The companies, which have the competition advantage, have to remember, that if they want to keep it they must use the strategy, which will be connected with development of chosen knowledge resources.

It elaboration connects with an answer on question about, which from knowledge resources permit to gain advantage and in which way is using (do we use it only in areas, in which we want to outrun the competition, or also in other)[5].

To manage knowledge correctly at first the objectives of such management has to be clarified, it means, what we want to reach. They are setting the direction to all organization activities by the impact on employee's attitude. The exampled objectives are introduced in table 2. 3.

Fundamental objectives concerning the strategically resources of development should be included in mission and vision of company next to presented target markets, clients and technologies. However such a approach is meet very rarely. Knowledge management should be based on knowledge vision, which designates the direction of development knowledge management in company. This direction result from general vision of company development, describing future aims and intentions. The vision of knowledge is formulated by the managers on the highest level. However if it wants to be realized it has to be change by managers being on average levels on normative, strategically and operational objectives, which are delivered to the bossed of average level.

Can be said that the knowledge management complete the traditional strategically planning. Formulate objectives, which through getting specialized knowledge will permit on reaching advantage competitive. The plans of knowledge management define [9]:

- Which skills are needful for the organization and in which way they can be reached,
(get form the surrounding or investment in internal development).
- Which skills should be protected and developed,
- Which skills can be admit as necessary and passed to partners.

Table 2. 3. Objectives of knowledge management in organizations (E. Kruk: *Wiedza w firmie. Personel i Zarządzanie*, Nr 1/2006)

Exemplary situations	What are the needs connected with using knowledge in company?
The information about possible participation in project realized in common with the best enterprises from industry came to the company. It is the occasion to approve oneself, raise the prestige, making new, promising contacts. Unfortunately the company was not able to meet the requirement of preparing on time the set of necessary documents.	Using of coming chances and possibilities.
Informatics with expertise from geodesy range go away from company. His work, relayed on writing specified programs transferring data, was invaluable for efficient realization of tasks by other employees. Unfortunately in advance the need was not even partly detected to formalize it knowledge. How and where to find quickly the person with similar skills? Will be this person able to correct and improve already existing programs or will have to create theme from beginning?	Having sure and stable position on the market, and not having the irreplaceable people.
The company has undertaken the realization of project similar to this, which was doing before it. This had to be carry easier because of gathered experience. Unfortunately in difficult situation, which reminded this from realized already project, nobody remember, which solution took then place.	Gathering experience and know how.
The worker of one bank since several dozen minutes without succeed is searching the value one of the popular economical indexes, needful for counting the risk of giving credit for one client. He is wondering why he has always problems with that, why the actual value of this index is not available directly after switching on computer standing on his desk? Apparently the directors of bank have bought the expensive tele-informatic technologies.	No wasting time of employees. Creating possibilities of fast information access.
The boss of department once again sees paper on his desk– query of workers about the treatment next to realization specified task. He knows that few weeks ago a lot of time he spent on explanation the issues, about which are asking now the members of personnel. Was the flow of the information not enough?	Proficient and effective activity.
The client interested in buying product distributed by company, put the question for the employee of selling department, with the test about explanation the rule of the product performance in some specified conditions and about giving few of it more detailed parameters. In connection with lack of possibilities of fast access to knowledge on this topic, the employee hesitate with answer, after two days appears that the client purchased this product in competition.	Fast reaction on customer needs
Why the next product which the company let on the market stayed on the same technological level what it last version, and the new product from competition has much higher standard. Where the bossed of this company had an idea on such a solution from?	To be innovative company on the market
Operator of mobile phones decided to offer new services. Has spent a lot of money on its advertisement but the project has finished with failure. Incomplete and out-of-date data, which where the basement of market analyze made that the service doesn't fulfill the important customers expectations.	Increasing service value delivered to the customer.
Sum of benefits	Being competitive on the market

The objectives of knowledge management should be formulated in three levels of organizational structure- on normative level (mission, vision of company, settings); strategically (made strategically plans); operational (realization of tasks). Normative level create the conditions favor knowledge management, on the strategically are described needs of organization connected with knowledge, but on the operational level is coming no realization of plans.

Thinking about knowledge management, in first step should convince all employees of company to this that all succeed or failure of company depends on the grade of using and development of knowledge resources. The second important case is consciousness to all, that knowledge management is a task for everyone, irrespective of place and occupied position in the structure of company, because everyone in everyday's activities has to create, share and use knowledge. The same important is conviction of higher level managers to manage knowledge, and also obtainment it absolute advancement and engagement. To reach the success it is necessary to trust politic, openness and tolerance of mistakes, which motivate employees to bigger creativity and testing new solutions [33].

In many companies the process of formularization objectives meet different obstacles, belong to theme:

- The lack of unitary terminology- vocabulary from range knowledge management is so far poor and process of setting objectives by specialist starts from establishing the basic terminology.
- The lack of suitable tools serving formulating objectives knowledge management- the problem with definition assumptions and plans on the operational level.
- Lack possibility of measurement- because of lack suitable terminology and tools impossible is expression objectives of knowledge management in numbers.
- Operational heaviness- reluctance of employees to implement new concepts impede to a large degree definition of objectives and their implementation.
- Position of employees- establishing objectives for single employee has impact on his position in organization. Objectives of organisation not always coincide with employee objectives.
- Limited possibility of control- because of this, that knowledge is immaterial resource, are not existing the ways of it full control.

2. 3. Knowledge management process

In knowledge management the distinction of six processes mutually connected is possible. It's about:

- Knowledge localization,
- Knowledge elicitation,

- Knowledge development,
- Knowledge transfer,
- Knowledge utilization,
- Knowledge storage and protection.

To get full picture of knowledge management the process should be supplemented by two additional elements:

- Formulating objectives,
- Knowledge appraisal.

All elements and connections between them are presented on fig. 2.1.

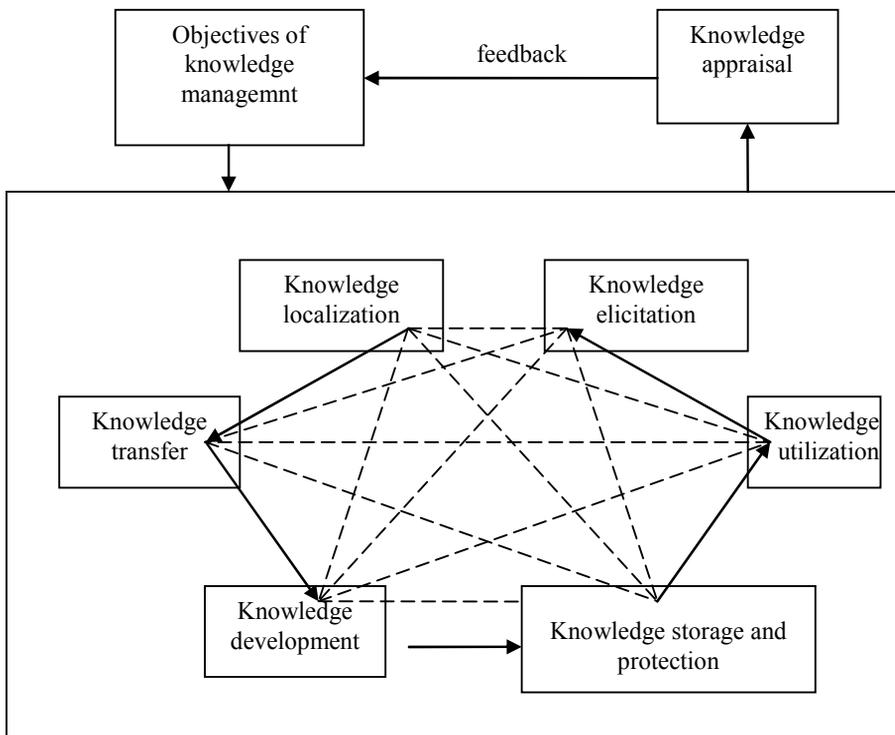


Fig. 2. 1. Elements of knowledge management (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 46)

2. 3. 1. Knowledge localization

The rapid development of knowledge and growing specialization cause that surprisingly many companies don't realize which resources they dispose. They can not get clear picture of data, information and skills both these internal and these external. In first step the knowledge should be identified inside the company and locate the resources of knowledge being in its closed area.

Lack of discernment as to possessed resources can very often lead to inefficient activity of structures and duplication having data, and through that to wasting time and effort people engagement in solving problems, which have been already solved. It happens also, that because of throng of data and information, which we are poured its difficult to find these appropriate, although it seems that they are at fingertips. That's why it is very important to get clear owned internal and external resources and that they will be available to each worker.

The elicitation and localization of knowledge sources are basement criteria of activity and competitive on the current market [20].

To rate the state of its possibilities many companies use benchmarking - compare own competences and effectiveness of activities with other competitive companies.

The method relies on finding companies, which gained advantage in some branch. These companies have to work at the same time or in wholly another sector of industry.

Benchmarking has a task to disclose the weak sides of company activity by comparison with their competitive. These methods permit also on definition new, needful skills. Without traditional benchmarking, relied on comparison with other companies, very often can meet with internal benchmarking, and relied on comparison two organizational units within one company [33].

Exist many factors, which can make in a significant way a difficult localization of knowledge. These are:

- Lack people responsible for localization and identification of knowledge resources,
- Often restructuring companies and fluctuation employees impede recognition who has which knowledge and who, is responsible for what.

To increase the clearness of owned knowledge resources tools are used, such as data list about experts, knowledge maps, topography of knowledge and also knowledge matrix.

The lists of data about experts are easy, not expensive and effective way on knowledge localization. It relay on making some kind of addressed books having data concerning specialists working for companies. Such a list can be done e.g. according to the most often happening problems, specializations, and researches topics, etc.

The knowledge maps have as a task playing relations reigned in company between existing in organization intellectual assets, resources of knowledge and it structures and using.

They don't include knowledge but fulfill only the role of a guide, indicating on knowledge resources, which can be people, data base or documents. Knowledge maps can be saved in an electronically form, can be organized according to different criteria and presented in a form of graphic programs. This cause that knowledge is available for many people independently on time and place [33].

Knowledge topography- topographical maps of knowledge enable fast localization of people, which dispose described knowledge and skills e.g. from marketing branch, logistic and finance. They deliver also information, on which organizational hierarchical level they are [33].

Exemplary knowledge topography introduced on fig. 2.2.

Employee	Computers	Transfer of technology	Finances	Accounting	Marketing
Tim McBride	█	█	█		
Sue Johnson		█			█
Jane Roberts	█			█	
Manny Jamal					█
Mike Cooper	█	█	█	█	█
Jill Barton	█	█			█
Glyn Lewis				█	█

Fig. 2. 2. Topography of knowledge (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 88).

Matrixes of knowledge take the form of two-dimensional matrix and can include different types of knowledge: explicit and tacit, external and internal, new and currently exist.

Creating matrixes of knowledge should start form choosing process, which in a large degree is based on usage of knowledge.

The next step is localization of knowledge resources necessary to run given process and people, which dispose theme [6].

In the next step is done the index of resources and people, which is implemented to the system of managing process. This in turn results in running mechanisms decentralized actualization of knowledge. The following steps of making knowledge matrix are presented on fig. 2.3.

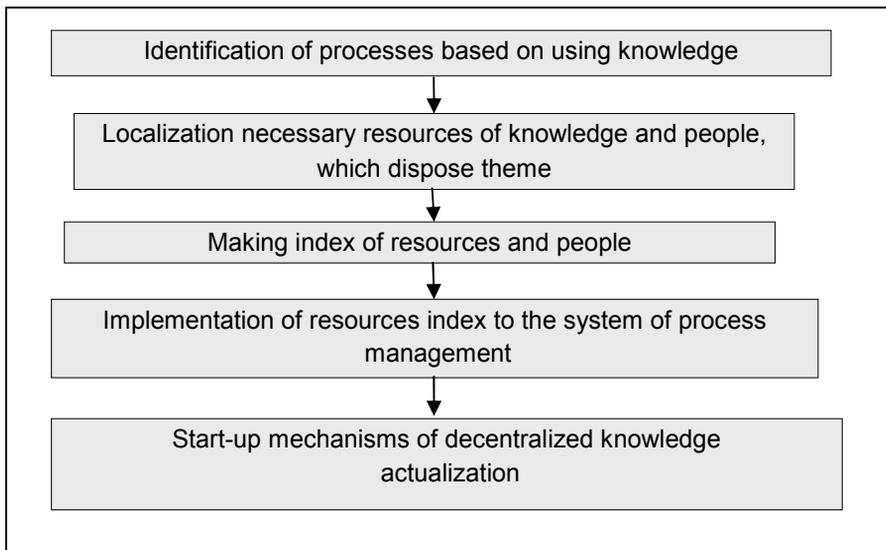


Fig. 2.3. Stages of drafting knowledge matrixes (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 90).

Using such a kind of tools should pay attention, to not allow obsolete information included in matrix, and also to locate in it only important and valuable elements of knowledge, because about suitability of matrixes decides quality included in information. Using matrixes of knowledge permit on generalization knowledge on lower levels of hierarchy in organization. In knowledge management very important role plays consciousness of that, which types of knowledge and which experts play important role in supporting defined processes. It's important to understand, that its necessary increasing availability to collective knowledge included in competences of company. For this purpose the companies basing on knowledge worked out many tools allowing on better using of collective knowledge. They have as an objective registration of experiments, improving cooperation and avoiding double work, and also making easier contacts with experts. The knowledge valuable for company is not

only inside of company, but it should be searched also outdoors company, in its surrounding. Experts, advisers and cooperates, suppliers and clients can be included to external sources of knowledge. Those are also external data base, Internet or specialist press and publications. Many enterprises use the knowledge consulting companies, agencies of market research and other subjects providing such kind of services. It has for purpose saving time and energy needful for searching, and also lowering risk of searching in wrong sources or wrong people.

In the last time have been appeared also s.c. brokers of knowledge, so the subjects, which are searching needful information, patents or partners. Having access to the newest discovers or technical achievements many companies keep contact with science institution or researches holidays etc. [33]. Localization of knowledge resources and identification permit on clear describing holdings. This information compared with knowledge management objectives, so this, what company wants to reach in the future in the range of defined competences permit defines which types of knowledge are missing. The gaps in knowledge can be filled or through gathering knowledge from outside or through creating and development of knowledge.

2. 3. 2. Knowledge elicitation

In the last years a large growth of knowledge resources and progressive specialization is observed in the whole world. It causes, that for companies it is more difficult work out own skills, which would permit on coping competition. Because of that, not every company can let itself on storage costly research-development facilities, more often can meet with occurrence of buying some types of knowledge. These are [33]:

- Knowledge of external experts,
- Knowledge of other companies,
- Knowledge of different groups of a market members e.g. clients,
- Products connected with knowledge- software, logistic systems etc.

The knowledge market is quite specific and imperfect. The products are rather future able possibilities than checked ideas, relations between buyer and seller based more on trust and long personal contact. The trade of knowledge has also this specific feature, that some searches goods can never appear on the official market (the licenses on the revolutionary technologies are sold for a long time before the work is finished on theme and don't come on the market).

The process of acquisition knowledge is however difficult from several reasons [33]:

- New knowledge, acquiring from outside can be rejected by company employees because of violation their sense of security, position and authority. It happens that good ideas or inventions are rejected only, because they come from outside - syndrome "bad, because not our".

- Another reason making getting new knowledge difficult is uncertainty to benefits obtained by it using and time, in, which can stay, reached. It's easier to assess the result of work, e.g. programmer, who has to do defined task than estimating which benefits can flow from promising worker.

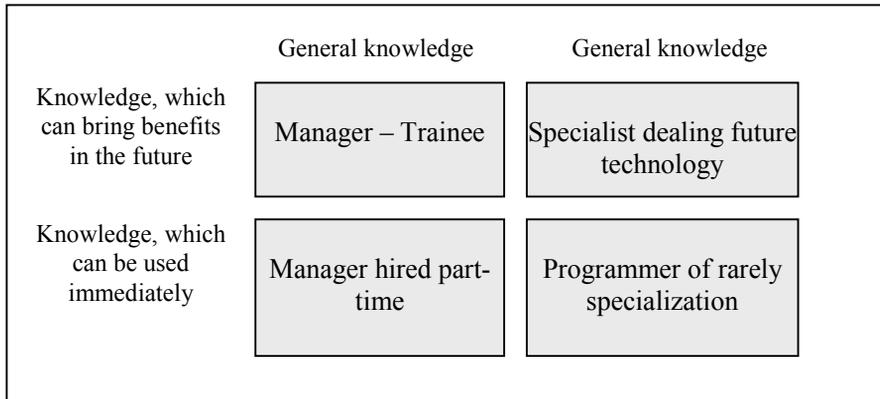


Fig. 2. 4. Types of employees knowledge (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 120).

- The next reason making difficult using knowledge is this, that knowledge very strongly depends on context; it means that, in which circumstances and by who is used. Taken out of context can completely loose in value. It's connected with occurrence internal connection resources and specification of different types of knowledge.
- These circumstances don't allow on no limited transferring knowledge between enterprises (its connected to the fact, that defined knowledge is stronger specialized and the same less valuable for other companies).
- Another difficulty is the ability of knowledge absorption, so it assimilation from surrounding and connecting with owned resources.

The issue of acquiring knowledge from outside of the company include: employment of specialists, cooperation with other companies, gaining knowledge from members of market [33]. Employment of specialists. Recruitment of employees is a very important element in a system of knowledge management. The new employees are selected due to need for company (both now and in the future) skills and competences. It's necessary to choose the employees effective and formulate exactly the requirements and also realistic, according to the needs of company presentation of candidate characteristic. It should remember that personal politic of company include not only the plan of selecting new experts, but has also the plan of keeping current. In some cases the employers prefer access a short-term contacts than

contracts on unknown time. It has place in sudden case, short-term order on specialist kind of knowledge. The most often way of using specialists knowledge without necessity of their stable employment is hiring consulting companies. The dynamic development of this kind orders market result that some of them specialize in some areas of economical industry, e.g. in building telecommunication network or in patent law other having main character of knowledge care about strategic development of company or organizational structure of company.

The cooperation with other companies permits on getting access to needful knowledge without necessity recruitment timely specialists. Cooperation can have different forms: from the most lax, which don't require big capital investments of knowledge to more advanced if its going about the cooperation degree, which requires bigger investments, but permit on whole access to the partnered knowledge of company [7]. The exemplary forms of cooperation presented on figure 2.5.

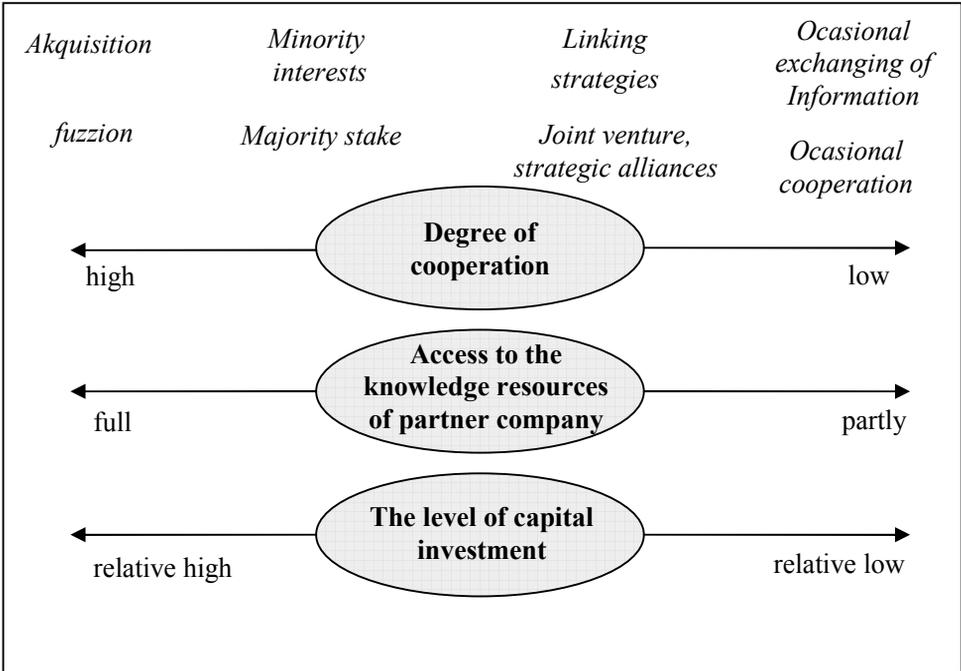


Fig. 2. 5. Forms of cooperation (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 127)

It happens that companies in order to acquire knowledge and complement lacks in own resources move to the most radical way, so to taking over the company. It

doesn't give the guarantee, that whole necessary and skills stay in this way gained and used. In case of taking over part competences forfeits, and the same connection of resources both companies doesn't give such effects how it would result from their summing up. It has an impact on big probability of incidences of conflicts, differences in organizational culture or difference in competences, going away the best specialists.

Other forms of cooperation, with less radical character give very often sometimes much better results if its going on possibility of using knowledge partner. The most often using form of cooperation, permits on using from knowledge resources of a partner is strategically alliances. They are linking very strong partners, and their task is mutually learning and gaining knowledge. Making decision about such a form of cooperation its necessary exactly familiarity with owned acts and competences, knowing future needs and knowledge of the involvement and competence of potential partner. During cooperation it has to be building trust mutually, not forgetting however about inclination of employees to opportunism, about possibility of information leak and about continuously obsolesce of knowledge. It's important also to avoid too much addiction from partner. The knowledge comes from the members of market. Each company can draw on external knowledge contacting with different members of market, which can be shared on some groups of business. On the fig. 2.6 presented division.

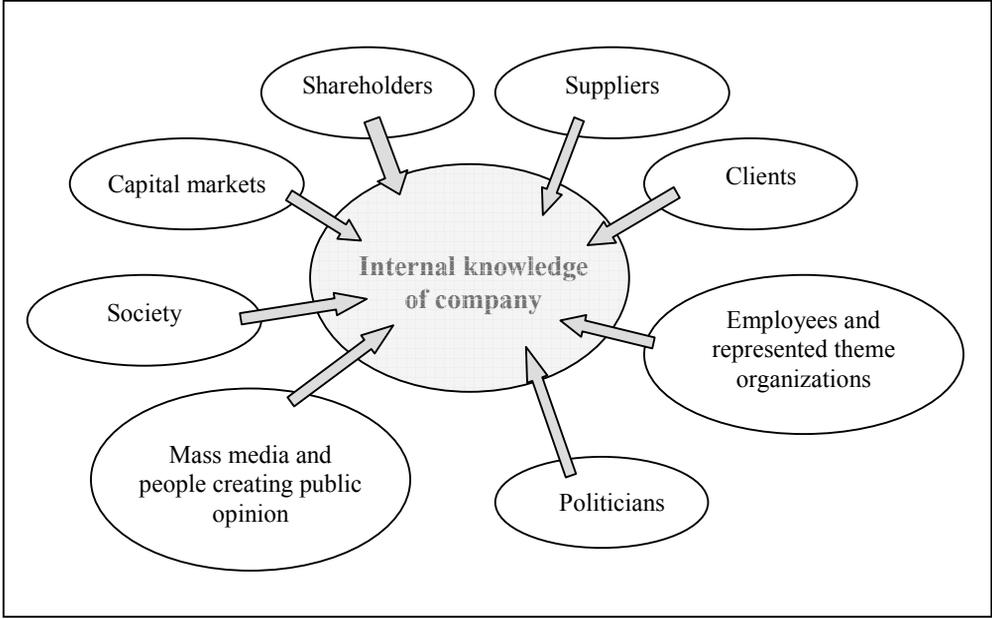


Fig 2. 6. Groups of market members (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 130)

Knowledge of each of those groups has a meaning for the organization, but in varying degree and in varying scope. One of the most important groups are clients, because they largely decide about success or failure of company. Knowledge coming from this group and delivered by conducting market research takes account of many issues, e.g. demand study, preferences, and habits connected with buying and level of profits, effectiveness of advertisements, sensitivity on changes, e.g. price etc. In some branches the opinions of clients are the most important source of innovation.

The clients know strong and weak points of products, so the cooperation with them can bring many benefits. They can be an irreplaceable source of information about them and also about market needs. That the cooperation will be fruitful it's important to work out language understandable for both sides.

The external knowledge can be acquired not only on the way of oral transmission, but also can be written on the different kinds of trays: CDs, in data base, books or videotapes, etc. or also bought in a form of software.

Such a data trays can be repeatedly used and through that permit on using from resources more number of people or organizational units. In shorter time many companies, which lead testing reserve the right to exclusive use from received results by getting on theme patent.

Use of the results protected by law is possible only through buying license.

2. 3. 3. Knowledge development

Very important process in knowledge management is its development. It relies on continuously deepening owned knowledge and skills, implemented more beneficial solutions technical or technological, improving products. Its scope includes all activities having for a purpose complement existing competences or getting new, which haven't exist till this time both in organization and outside it.

Owning research - development teams doesn't give guarantee, that the company will be able to develop new competences. So very often it's coming to the cooperation with other companies. They can have different forms (from cooperation with concurrence companies to the outsourcing parts of researches for other companies). Wanting reach access to the new ideas many companies cooperate and keep stable contact with academic holidays and research institutions [33].

To gain a competitive advantage it's a necessary development of knowledge but this one can meet few obstacles [33]:

- **Reluctance of employees to the new ideas.** Every new idea or implementation of innovation weak up the fear of the unknown, especially, that its linked with rejection current patterns or habits but its not possible to predict the finished effect.

The workers feel also fear of the loosing their position in company and disorder the hierarchy. Due to shoulder lack of needful skills, knowledge

or qualifications their position in a company can weaken or strengthen these, who that knowledge or skills have. The problem can be also mismatch company to implemented innovations or external factor in a form of legal provisions or lack of specialists.

- **Spontaneous formation of innovation.** Describing or exercise control on the process of building knowledge is not possible. It's very difficult to predict and in big degree rely on fortuity. Increasing the financial issues on the department of research and development doesn't guarantee better effects it working. Is only possibly ensures to create conditions favoring the development of knowledge.
- **Incoherent development of knowledge resources.** It happens that some areas of knowledge are developed too intensively, and forget at the same time about main assumptions of knowledge management and the most important trends, which they set. It can lead to the unnecessary financing research projects which in small degree influence on increasing competitive product on the market.
- **Duplication processed of knowledge development.** It happens that because of discernment lack in company resources or under the influence of routine some activities like creating reports is repeatedly performed, without considering if this is necessary. It causes additional costs.
- **The problems with keeping the position in the market.** In the current world development of knowledge is so rapid and run in so short time, that gaining advantage over competitors is very difficult (in pharmacy, only company, which first implement any medicament in the market can count on full refund costs of researches). Additional the profits drawn on innovations are smaller and are shorter and the possibility transition specialists to the competitive company and access of knowledge additional decrease theme.

New knowledge is formed in a head of single workers, and then later is transferred and transformed in organizational knowledge. The process of knowledge development should first of all ensure the conditions favoring creating the innovations. One of theme is enabling employee's expression their ideas. They can't see the daily light, when the organizational culture doesn't favor changes in company. Another condition which permits on increasing creativity of employees is tolerance by the organization mistakes result from searching new solutions.

Organizational culture which doesn't allow mistakes doesn't let on development and create atmosphere in which the fear before the consequences of failure inhibit creativity of employees. It's also important to have the time for the non-routine activities by employees it means that the overflow of responsibilities become not the reason of decline creativity [22].

In the Japan companies there is a view that creation of new knowledge in not only the merit of appropriate transferring information, but first of all depend on skilful extraction hidden and often subjective views and intuitions, etc. Following employees, and then causing that they become available for testing and checking by whole organization. For understanding process of gathering and competing knowledge by organization, Japans researches Nonaka, Toyama and Konno have proposed the model developed later as a concept “**organizational development knowledge**” [21].

According to the theory of explicit knowledge and tacit they are not at all separated, but mutually complement, what introduced on the fig. 2.7 in this process comes to four ways of knowledge conversation, namely: to socialization, externalization, combination and internalization (in short SECI) [20].

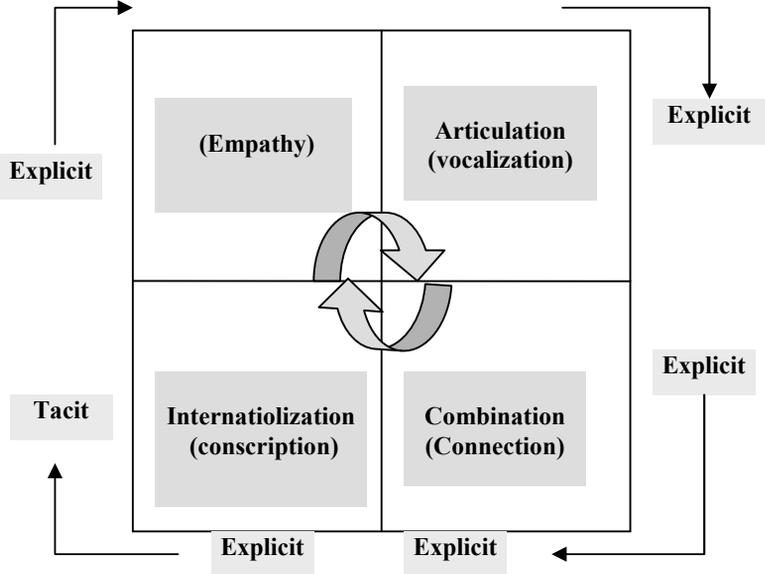


Fig. 2. 7. Process of knowledge creation (E. Głuszek: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. 2004, s.86)

Socialization – it means conversation of tacit knowledge single employees in a group of tacit knowledge. Usually the process takes the form of dividing tacit knowledge of employees through experience. Because of difficulties with formalization this type of knowledge can not be used by all organization. To convey this knowledge comes by common contact “teacher” and “pupil”. Acquisition knowledge and skills follow by imitation, or by informal meetings out of the company where can come to free exchange of views, own considerations, etc.[20].

Articulation - is a conversation of tacit knowledge in explicit knowledge. This process follows when the tacit knowledge of employees can take an expressed form, i.m. it can be introduced in a form of not written so far rules and rules of conduct. It became then easier to penetrate and can give rise to new knowledge. As an example this kind of conversation can serve cycle of quality control enabling improvement of production process for employees. Wanting express tacit knowledge can be used metaphor, analogy and models. This ways enable on graphic introduction thoughts, clarified features of occurrences or items, and also to describe dependencies between some variables [20].

Combination - it's a way of conversion explicit grouped knowledge in explicit structured knowledge. It relays on connecting current elements of expressed knowledge in more structured enclosure (it doesn't mean that current base of knowledge will enlarge). Explicit knowledge is gathered both in organization and out, then connected, edited and presented e.g. in a form of summary or reports other members of organization. Nowadays the tool enabling whole process is informatics technology, letting on creating computerized networks and data base [20].

Internalization - is the last way of knowledge conversation. Knowledge change from explicit to tacit knowledge. It means that employees, which assimilate some available knowledge and distributed in organization, connect it with owned skills and implement in own work causing arise new resources of no expressed knowledge. Such a knowledge concerning individual employees can run on new process of creation knowledge through socialization [20].

How results from the above development model of knowledge is continuously processed, in which tacit knowledge change in explicit, and explicit change in tacit, while these changes increase constantly the resources of knowledge available in organization [21].

The next important occurrence in a process of knowledge development is transition from knowledge of individual employee to grouped knowledge. It's proved that the group of people cooperating with each other and sharing common responsibilities can rework competences which don't have it individual members [43].

On the figure 2.8 are presented factors, which contribute to extract knowledge individual people and including it in collective process of knowledge development. Communication permits on exchanging opinions, on conversation own ideas and views, and also experiences with opinions and ideas other people in organization. Lack of good communication cause that the knowledge is not able to spread and the employees cant not yield common solutions.

Interaction let on development intelligence in organization. "Organizational success is so in bigger degree consequence of relation, which is between resources of knowledge, gathered by units, than result of knowledge these units" [43].

The transparency of knowledge permit on better using owned competences. Integration permits on connection skills following employees in functional enclosure.

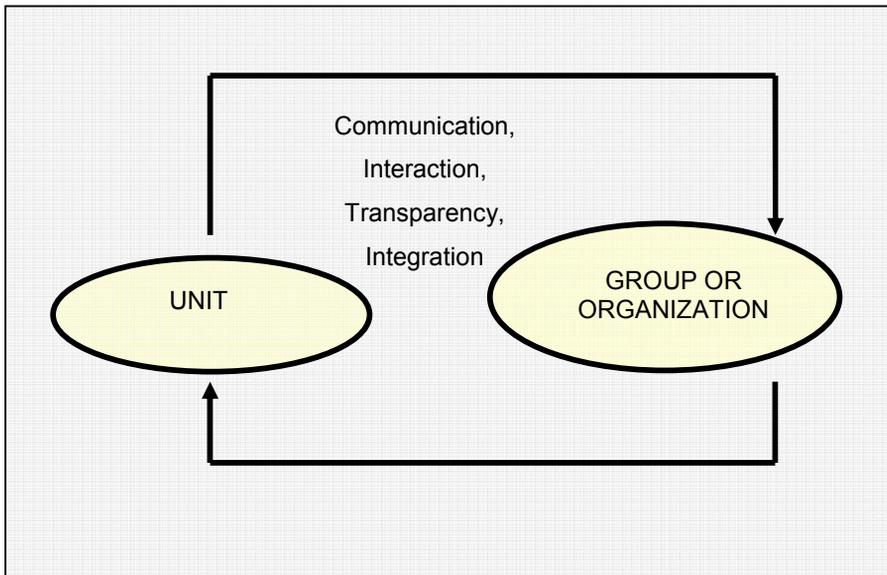


Fig. 2. 8. Process of arising group knowledge (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 156)

Wanting support of grouped development company uses few solutions. Many organizations rely on s.c. experts staff. They focus nearly whole company knowledge (these are teams of specialists or all researches teams, and the last take a form of whole holiday research-training or company e.g. Motorola). Their main task is creating key resources of knowledge for all organization. Another way supporting development of knowledge is creating teams to innovations (clinic of products). To their tasks belong comparison current products and processes of competitive companies e.g. disassembling on parts the same products and analyze in terms of construction, used materials etc. such a team create specialists from all departments of company. During realization of project members of teams gain the knowledge, which can be later used in realization of other products. That's why analysis of proposals is so important. When the realization of project is coming till the end the members of team should meet, to summarize work, analyze through gained during performing the task knowledge, draw conclusion. Information obtained in such a way should be saved in data base and be accessed for the other members of organization. It has to serve most of all in avoiding committed mistakes and strengthen the process of learning [43].

2. 3. 4. Transferring of knowledge

Thinking about development of knowledge in company can't forget about necessity of transmission knowledge for the other. Currently still in overwhelming part dissemination of knowledge takes place out of formal structures and without meaningful integration of managers. Transferring knowledge and information take place during every day tasks, advices and information, exchanging of opinion. Sharing knowledge is an inherent element of life organization.

Thanks to that process knowledge became available for a larger number of people. The main aim of sharing knowledge is delivering it to those places in organization, in which is more needful. It should remember that it doesn't mean the employees have whole knowledge available in organization, but they have knowledge needful next the realization of their tasks.

It has to serve efficient functioning of organization. It results however that in many companies efficient sharing of knowledge is a large problem. As a result of researches result that in average organization are used less that half possessed intellectual capital, resources of knowledge are in posses small group of people and don't go to each place, in which could be used with benefit for a company [43].

Sharing knowledge and distribution it is important because of few reasons :

- In direct way influence on management quality (TQM - Total Quality Management) and sometimes, through that influence on competitiveness of company,
- Improve coordination of tasks in research - development departments and marketing, what enable on shorting time of coming product on the market,
- Permit on drawing conclusions and avoiding mistakes earlier fulfilled,
- Can influence on improvement of serving clients level (e.g. enabling employee access to the certain kinds of knowledge he can answer on the questions of clients in shorter time),
- Enable building single image of company even dispersed in the whole world, e.g. McDonald's.

On the figure 2.9 are presented few ways improving transfer of knowledge [43].

Knowledge transfer between individual employees or their groups in organization can be done in several ways. The easiest knowledge transfer divide on knowledge distribution by direct contact involved people or via informatics technologies. So far the conversation is the easiest and the most effective way on transferring knowledge. Employees through exchange of opinions, sharing own views contribute to development knowledge in organization. In a case of many problems, in which solution require specialist knowledge, informal meetings are not adequate. They permit only on generation new ideas and unconventional solutions. Development of tele-informatics causes that contacts „face to face” are more often substitute by virtual contacts, which however don't give the same results.

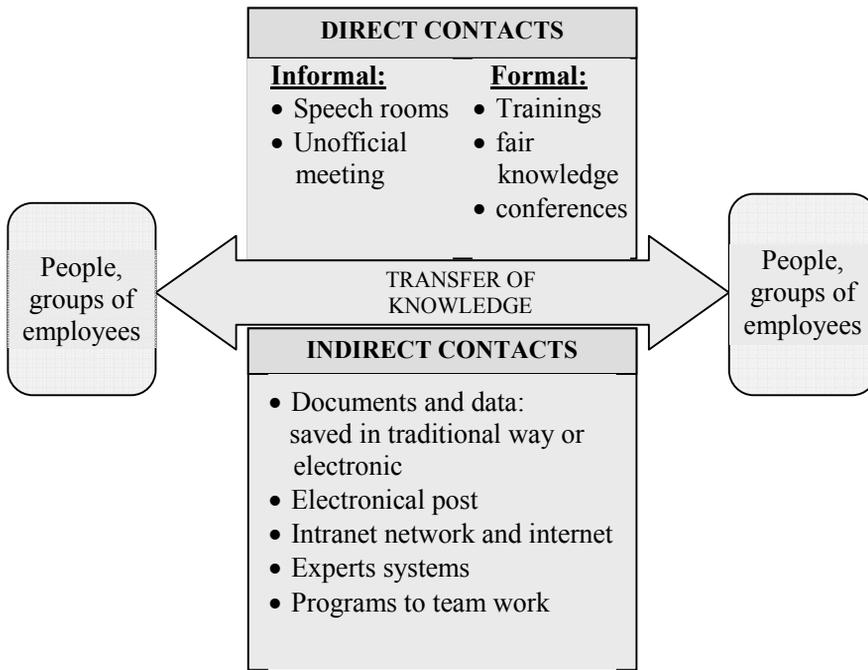


Fig. 2. 9. Ways of knowledge transfer (Opracowanie własne na podstawie E. Głuszek: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. 2004)

One of the way for transferring knowledge, used in many Japan companies are s.c. “conversation rooms”, in which employees can during the day spend about 20 minutes talking about different topics. Their main task is creation of an atmosphere, in which free conversation causes, that will reveal new ideas, which can be used with benefit for company [20].

Besides informal meetings, very important role in transfer knowledge play formal contacts such as: different kinds of trainings, fair knowledge, conferences, etc. fair knowledge, organized by some organizations enable free meetings people hired in different departments and organizational units. Employees can meet with chosen people and discuss bothering theme problems. Such a meetings permit also to start new, interesting contacts, which in the future can be very helpful.

Conferences differ from fair in that take more organized form. Taking part in the conference has planned all courses, lectures, exercises and trainings, etc. For the correct run of knowledge transfer it is necessary to use two methods of knowledge

exchange. So the informal meetings should find more structured forms of exchange knowledge and information [8].

When is necessary to deliver described resources of knowledge for many members of organization process of duplicating knowledge are used s.c.. The employees become fast and gain stable access to defined resources. As an exemplar of duplicating knowledge can be used different kinds of trainings, e.g. in a range of using from new software. Duplicating knowledge concerns two important areas: implementing employees in organizational culture and their trainings. Implementing employees in organizational culture has for a task their familiarity with habits governing in the company. Describe place by theme occupied and responsibilities and expectation which link with that.

Very often take a form with collaborators or departure, integration meeting. Duplicated can be also specialist knowledge. It has impact on continuously development and raising skills. In many companies are organized few times in a year specialist trainings dedicated defined topics [43].

Generating adequate conditions can influence on distribution knowledge in a company. Knowledge can reach not only through the way of personal contacts, but also knowing documents and data saved in traditional form - on the paper or in electronically form. Progressive development of companies forces to use facilities of technique. More and more companies attach importance to efficient work of informational system based on computational network including whole company. Besides duplicating knowledge we have got to deal with “pushing” knowledge to company. Decision about which knowledge is necessary and for who was on the highest level of the hierarchy. Beside decentralized infrastructure of distributing knowledge we have to deal with process “drawing” knowledge. The rule of “drawing” is based on the conviction that the user of knowledge can precise own needs and the task of organization is providing him fast access to needful information.

Advanced technological solutions, enabling distribution of knowledge in a company can be shared on two groups: computational network working in a area of whole organization and programs to group ware.

One of the ways enabling communication is electronically post. It enables sending information to chosen recipients. Its main restraint is this, that comes to defined group of people (sender has to know addressed of person, to which is sending message). Its also lack of control on cohesion sent information (in the same time in circulation can be few conflicting information). In some companies is used internal network called Intranet. It's a network working similar as Internet, but its limited to some number of users the most often employees of company. Using intranet network gives more security than using Internet, because the rules of using it describe administrator and Internet doesn't yield any control. Intranet networks provide also access to the freshest information. Expert systems provide for the user access to

information. They include knowledge from a range of product technique data, information regarding clients, comments from users of products.

Thanks theme e.g. the employee of service can diagnose the defects and set the way of their fixing, can share it experience with others. The seriously defect of expert systems is need of continuously actualizing data, what contribute to the delays in access to the needed resources of knowledge. Programs to grouped work are becoming more popular. To their most important advantages belong: keeping cohesion in transferring information and good coordination of whole process thanks using some mechanisms. Such a kind of programs can be used in project management, because they permit on creating schedule of work few employees. Another kind of program such type permit on management flow time (has control on designed flow time – after finish some step of work is initiated the next one) [43].

Obstacles in sharing knowledge and distribution of it in company connect most of all with types of knowledge. Explicit knowledge gathered in documents or data base can be transfer quiet easy by using informatics technology. In transferring tacit knowledge are connected personal contacts. Transfer of this knowledge can receive different forms, e.g. giving clues, participation in works, terminating, but it always base on the meeting face to face. In many companies the new employees are given under the care of other members, which have as a task introducing theme the rules in a company and new responsibilities and passing theme necessary knowledge. Very often the role of guardians fulfills managers of higher level, and in most of the workshops it's the responsibility of bosses on the each level of hierarchy. Very big impact on the process of distribution knowledge has the organizational culture. In big degree it can impede or make easier this process. In the table 2.4 the most often brakes of knowledge transfer was presented resulting from defined features of organizational culture and ways of their overcoming.

In the company we can meet also rather barriers inhibiting distribution of knowledge. Belong to theme the follows [43]:

- Barrier of power,
- Motivation barrier,
- Barrier of culture standards,
- Barrier of trust,
- Barrier of environment,
- Barrier of language,
- Barrier of reputation,
- Barrier of personality.

Table 2. 4. Cultural barriers impede flow of the knowledge in organization
(C. Evans: *Zarządzanie wiedzą*. 2005, s. 45)

Brakes of knowledge transfer	Possible solutions
Lack of trust	<ul style="list-style-type: none"> • Building relation based on trust and feeling community through keeping direct contacts and on distance • Propagation of communication forms favoring flow of knowledge
Variety of culture language, lack of common language	<ul style="list-style-type: none"> • Building common basements through education, discussion, team work, rotation of positions and rather forms of interaction • Shaping common language
Lack of time and place of meeting lack wide division of opinion on efficiency work	<ul style="list-style-type: none"> • Creating places and situations favoring explicit and tacit exchange of knowledge • Encourage to experiments and entertainments • Help managers in meaning, what in real is the performance of work
Rewards for owners of work, lack motivation to sharing knowledge	<ul style="list-style-type: none"> • Rewarding those ,which share knowledge and can use the knowledge from others
Limited ability to assimilating knowledge	<ul style="list-style-type: none"> • An awareness people the advantages of flexibility • Reservation time on transferring, growing and using knowledge
Conviction, that the knowledge is assign to the described groups and positions	<ul style="list-style-type: none"> • Creating atmosphere In which the value of ideas is more import ant from their source
Intolerance of mistakes and lack of support, when the help is needful	<ul style="list-style-type: none"> • Tolerance of mistakes commit in a frame of creative work and help in drawing results flowing from theme

Barrier of power is the most often reason which inhibit transfer of knowledge, because one of the power aspects owns knowledge, to which other has not access (expert power). Reluctance to sharing knowledge result from fear before losing power, and what's link with that privileges, prestige, and judgment, esteem of surrounding. Defending this barrier is very difficult and takes a lot of time. It requires working out adequate organizational culture based on egalitarian rules and community.

Motivation barrier is nothing else like lack of adequate system to awards employee for contribution in spreading knowledge in organization how also using gained knowledge. Adequate motivation system most of all should promote cooperation between employees and grouped work, awarding all groups, not individuals.

Barrier of culture standards on the process of passing and spreading knowledge in a large degree organizational culture has an impact. In organization, in which knowledge is treated as a main property the distribution is easier. Here the interests of units have to be subordinate interests of group and there is no place on "cult of individual" and far moved individualism. It's important that the privileges connected with following levels of power will be not much varied. The point is to spread ideas of equality and unity of interests, and also to constantly intensify the feeling of membership to the group.

Passing the knowledge can make it difficult also the opinion that the employee should be independent and self-sufficient. Asking for the information or help can be read then as incompetence. Transfer of knowledge is in this case inhibit by the fear of given to the own unawareness. Another reason refraining spreading of knowledge can be too variety organizational culture. Lack of unequivocal norms and standard values can make difficult communication and cooperation. Employees, who share the same opinions and profess the same values have easier conversation and find common language, what accelerate the process of passing knowledge. The task of organization in this case is promotion of properly and homogeneous culture standards by awarding adequate attitudes and required behaviors.

Trust barrier. Very important element of good knowledge transfer is trust of employees to superiors. Spreading knowledge both is it gaining and passing for other. It must remember to keep the balance between these processes. Employee can fell fear before using knowledge by surrounding and before losing own position. Building the trust in a company is a long process and requiring consequences in working. Should base on the rules of honesty, justice and responsibility (fair system of mark and awarding, equal access to information on the topic of company and it aims. Trust is being gained through the nearest knowing and understanding, that's why the task of organization is generate conditions favoring development of contacts not only at work, but also out of it.

Environment barrier „The import of knowledge require existing adequate context- physical, virtual and mental.” [20] Physical context relate to dispose by the employees special places, in which they could meet, talk freely, discuss and make contacts. The second relate to possibility of indirect contact with other employees - through informatics networks. The mental context connects with organizational culture. It concerns existing community views, beliefs, and rules of conduct making easier communication and cooperation.

Language barrier connect with existing variety patterns of conduct. Transmission of knowledge can be impeded by uniform lack in organization, understandable for all language. It has impact on gaining knowledge both from employees other fillies and from the clients. Overcoming this obstacle is connected with top, planned actions having for a purpose elaboration of common vocabulary (also for the clients), and also with creating occasions to formal and informal meetings.

Barrier of reputation has direct union with gaining knowledge from other people. Person with low reputation (resulting from e.g. young age) is not able to transfer that much, as the person having good reputation. When the information come from people with better opinion have chance to be better assimilate.

Barrier of personality relate on lack some interpersonal skills in transmitting knowledge to other and in assimilation from other. The way to overcoming this barrier is using right personnel policy, especially careful selection of employees.

Most from listed limitations in spreading knowledge has cultural character. Additional they connect with each other and mutually penetrate. The better transfer of knowledge can be reached through usage for this purpose informatics systems, but they are not the main determinant of success in spreading knowledge in a company. Many managers put big attention on implementing costly computational programs, forgetting about building good atmosphere and interpersonal relationships, which would favor sharing knowledge.

These systems proved correct in a case of big companies, with international range. In a case of small companies are enough traditional methods of spreading knowledge based on direct contacts [20].

Exist many ways to link traditional and modern systems of transferring knowledge, working as a rule of combination activities of human and informatics systems. As a example can be used employment internal experts, having for a task help the users of system or administrators of network taking care on correctly working system, selecting information, correcting mistakes, etc. Hybrid solutions have better value, if improve more the contact with specialists.

Attention has to be put on the transfer of the best solutions for the enterprise, s.c. internal benchmarking and external benchmarking. The main obstacles in this process result from the lack of the sufficient knowledge of unit implementing solution (it's not able to value resulting benefits).

2. 3. 5. Usage of knowledge

Even if the resources of knowledge are being located and complemented about needful information and skills. It doesn't give certainty that they will be used with benefit for the company. The psychological barriers cause that the workers are afraid of new things and very often resign from it, because they feel better and surer in old structure.

Great improvements and changes don't bring benefits for the company if they are not accepted and implemented. To talk about big succeed of knowledge management can be possible only when it will be used in activity, because only that gives visible and possible to measure results. So the most important task for the process of knowledge management is using group knowledge and units to reach aims and intentions of company. [20]

Localization, gaining, and development of knowledge and also its transfer should always take into account the needs of knowledge users. Often mistake which doesn't enable or in considerable way impede using from information is it not adaptation to the needs of people, who use it (e.g. informatics incompatible systems with other programs or don't taken into account specification of organization, too long and haven't essential rapports).

Usage of knowledge can be limited by many obstacles. Some of them are [43]:

- Psychological barriers - overestimating own worth or for fear that, position will be lost, cause, that the employees do not use all intellectual potential, which they posses.
- Atmosphere in a place of work – rules dominating in a company can be in big way limit the benefits flowing from using knowledge. It happens that the employees don't search knowledge at colleges because it could be read as a lack of competences, but the seeking information in other departments would be admitted for the test of discredit or the distrust of the colleges.
- Practice – sometimes the new knowledge seems to be needless and not possible to use, because everyday duties we start to do automatically. If we work too long on one position we don't see necessity to implement changes flowing from the exchange of information. We don't believe also in improvement of efficiency through implementation new procedures. When such a situation concerns whole enterprise, then is called “organizational blindness“.
- Command – that if the owned knowledge will be used or not, depend also on managers and personnel. They have a task to create conditions favouring transferring data and gaining new experiences. Another role is convincing employees to critical sight on job made and searching better solutions (both on outside and inside organization).

On the degree of using knowledge resources clear impact has also their availability. More often we are reaching to resources, which are for us easy available and their gaining doesn't require effort. Informatics systems make much easier use from resources of knowledge, should be easy in service, compatible with other systems, and also the answers on queries the user should get quiet fast [9].

Another factor having impact on using available resources is integration. Knowledge, and especially tacit knowledge included in skills of employees is knowledge high specialized and concern narrow area of technician issues or economical. Some specialists from the department of knowledge management think that just the integration of knowledge and the ways of it connections, and not alone decide about competitive advantage on other enterprises (advantage posses these companies, which can come to the knowledge of specialists and use it to reach own objectives).

It can't build constant competitive advantage only basing oneself on the specialist knowledge because of three reasons:

- Knowledge is an attribute at particular people, who are not constantly related with enterprise.
- Knowledge of employees is not the property of enterprise.
- Pensions generated by specialist knowledge in a bigger part are recognized by the units.

Currently increasing interest cheers s.c. theory of enterprise based on knowledge (knowledge- based theory of the companies), which says that "benefits exist from specialization in gaining and development of knowledge and also that the production of goods and services require wide part of different specialist fields of knowledge, but the basic task of organization is coordination of effort many specialists" [20].

Largely about the degree of using knowledge decide it quality, so the benefits, which can be reached from it assimilation.

If the company implement complicated computational system, which will not contribute to the improvement of work organization, will be ignored or will be used in a small degree.

To use the knowledge fully attention has to be put on keeping balance between costs of searching and gaining knowledge with benefits, which flow from it using. In development and usage of knowledge consciousness of possibility play very big role in practical application. For this purpose trainings can be organized on the positions at work. They serve for the gaining knowledge through its direct using. Exist many kinds of such type of trainings e.g. learning by action" (action learning), which base on gaining knowledge and it simultaneous using for solving the problems. Except such kind of trainings can be used also in different kinds of planning games, scenarios and simulations imitating conditions of real world" [43].

The next impact factor on the level of knowledge usage is the conditions of work. Deployment of fields and positions of work in area of building should make it easier communication and exchange of knowledge. Communication inside the company is going very often by different kinds of documents, business notes, etc. that's why the graphic layout and legibility of document is so important, because they can decide about that, do the information will be assimilate or rejected.

2. 3. 6. Security and preservation of knowledge

Process of knowledge preservation is also very important element of knowledge management, because enable organizational learning and using from gathered knowledge. Preservation of knowledge is connected with s.c. organizational memory, so the possibility of storage experiences, opinions and results [43].

Knowledge results can be stored not only on different kinds of trays, data base and documents but also in the brains of employees. It should be kept in a mind e.g. next to restructuring the company (outsourcing), to not loose irrevocably important part of resources.

Dismissal employee can reach short time economical benefits, but in longer perspective of time that can connect with big problems e.g. with the gap in knowledge know-how, which filling will require hiring specialists from out of organization. The solution of this problem can be identification and keeping in the company pivotal employees.

The process of preservation knowledge can be divided on three stages, which where presented on the fig. 2.10.



Fig. 2. 10. Main steps in the process of preservation knowledge (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 231)

Selection of knowledge is nothing else like the choice which and whose knowledge resources should be preserved. This is difficult task even though the amount of information coming every day. The question which can help in making decision sounds: what would happen if given person is already gone from company? Putting such question awareness, how important is adequate carrying on documents by the employees. If important for the company data and information are implemented to the informatics system, will be available for the other even after leaving of employee.

In this way the knowledge is consorting to be dependent on units and become the part of organization results. The problem, in this case is alone process of selection. In many companies it is not perfect and based on the routine and intuition. It's also no sense the arrangement whole knowledge of organization, they are also fields, which require special attention – that are s.c. areas of basic knowledge for the company, e.g. where are collected information concerning preferences and requirements of particular clients. As the basic criteria of knowledge selection we should acknowledge it usefulness in the future. Unfortunately decisions are posing by risk of wrong choice, because we can't predict till the end of future events [43]. Knowledge which we have subjected selection, store in archives of knowledge. In organization the role of archives fulfill single people, team workers and also computers. The brains of employees are the most important place, where the knowledge is stored. However it has the inconstant value, because together with leaving one employee from company the specialist knowledge and skills will be lost. That's why it is important to create in the company these conditions, from which nobody wouldn't like to resign.

The point is good atmosphere at work, but also motivation systems based on material encouragements and social, and also on individual needs of employees. Keeping good relations with last employees of company (e.g. experts, which have opened own business or got retired) permit on using from their knowledge resources. It can use from their knowledge and skills e.g. hiring theme in character of trainers or consultants. Another way on keeping in the company needful knowledge is training for the new employee by “master”. The pupil is gaining in this way knowledge and skills of teacher and the results stay in the company even after leaving employee. It has to remember that the preparing “successors” require longer time, because the transmission of knowledge should be done gradually. Grouped knowledge can maintain thanks making protocols from meetings, common discussions, and also creating terminology understandable for all. It has big meaning because the knowledge passing oral is a better receive than if it would be passed in written form. That's why creating common language is so important for all company, and also transference it for young employees.

Beside human memory company can keep data and information in electronic form. Development of informatics lets on gathering a huge amount of data, and digital trays have many advantages e.g. are easy in use, can be used many times and it's easy to distribute theme. Are flowing also the dangerous resulting e.g. from overflow of information (overgrowth of data base) [43]. The future of company depends not only on the amount of owned knowledge. Information has to be also available for all users, and also constantly actualized and verified. It's a necessary process due to short cycle of information life in a current world. Actualizing information connects with the quality of information, and also access to theme and has for a task preventing unfit of knowledge. So called trap of knowledge unfit crates closed loop.

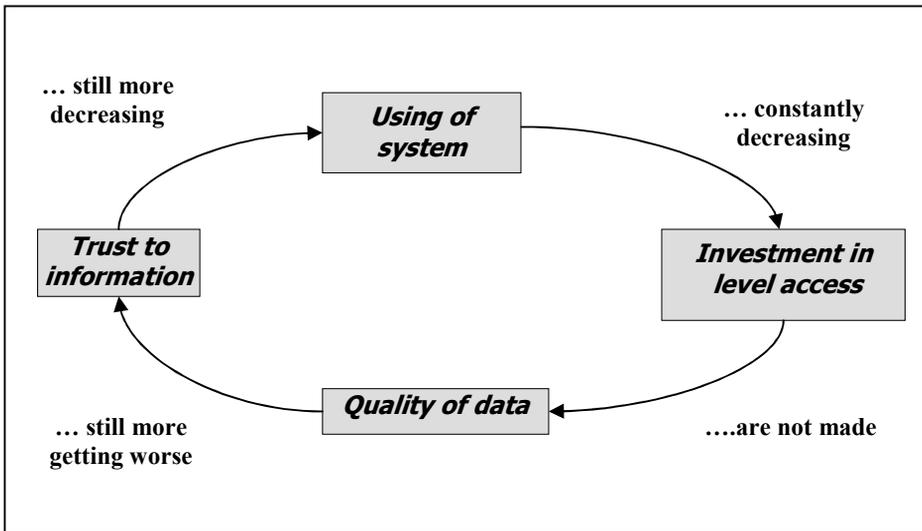


Fig. 2. 11. Trap of knowledge now (G. Probst, S. Raub, K. Romhardt: *Zarządzanie wiedzą w organizacji*. 2002, s. 247)

When the quality of owned data and information is getting worse, decrease the trust of employee to obtained information. This cause, that the usage of system decreases, and information stops to be actualized. With decreasing using of system is connected descent of investment in availability level and that in turn contribute to getting worse quality of data, etc.

The security of owned knowledge is the last important issue connected with knowledge management. Knowledge in itself can decide about competitive advantage of company on the market and that's why companies in different ways prevent it flowing out, and limiting it observation protect themselves before it imitation. Protection of knowledge is a complicated task, causing many problems, if only because on narrow defined ownership, which formulation and maintenance require large outlays, possibility of illegal imitation or no owned resources, and also for the sake of knowledge nature, which has character of public good.

Companies can rightly protect on three ways valuable resources of knowledge [20]:

1. Using provision of employment,
2. Through designing work,
3. Through establishment of prizes.

First way of knowledge protection is adequate formulating of contracts concerning employment of workers. Through conclusion of the contract some regulations (norms), company in big way can limit or prevent no valuable knowledge. It can be reached on few ways [9]:

- Providing company the role of the only employer hired person,
- Including in the contract clause prohibiting employee talking about company with people from outside,
- Commitment of employee to work with defined people, in defined place and time,
- Including clause about prohibition of undertaking work in competitive company in a period of time after termination agreement with current employer.

Another way to knowledge protection is such a designing work which prevents employee's access to whole company knowledge. It can reach by large specialization of knowledge and properly contracts of work.

Third way of knowledge protection is adequate to establishment prizes in time of worker employment. Wanting to prevent eventual leaving of employee and thus protect yourself before valuable knowledge loss company can use number of tools e.g. premium for the seniority in the company, auto business, payment of insurance and medical services, rest, etc. creating adequate organizational culture can also favor staying employee in the company.

Because protection of knowledge connect with defined costs for the company, it's important to properly estimate the benefits, which are resulting from it. At first should decide which knowledge requires protection and which not. Only unique knowledge, which is used in technological and organizational processes will have reflection in features of product or service and will bring for the company benefits, should be protected. The next important issue is adequate selection of means having for purpose protection of knowledge. Insufficient protection can cause no excessive knowledge, what can overstate costs. Some mechanisms of knowledge protection have for the purpose limit the transfer of knowledge inside company. We have here dealing with contradiction because each limitation having for the purpose protection of knowledge before it decline block development, multiple and consolidation of knowledge. That's why selection of adequate mechanisms is so important. Beside those methods exist also a number of legal rights connected with protection of intellectual knowledge.

Rights of intellectual property have for the protection purpose valuable especially for the company knowledge, which very often decide about innovation and competition on the market.

Rights of intellectual property constitute the group of civil law norms, describing rising, text and transfer rights on immaterial goods being result of intellectual activity of human. Within this right we distinguish property: science (concerning invents projects and know-how), artist (author rights), and industry (law to trade marks)" [20].

Knowing and using the rules of knowledge protection is important for the right functioning company for few reasons:

- The company can be fined because of violation somebody intellectual property
- Neglect or renunciation of protection own resources can lead to their losing for the competitor, and the same can decrease chances to getting competitive advantage,
- Knowing existing already resources of knowledge being protected can prevent meeting the costs for searching solutions already existing,

Protected knowledge can be divided on two groups: knowledge protected explicit and tacit knowledge. Explicit protected knowledge characterizes by the fact that protection is on the given area, in defined time and for a particular subject and become acquainted with it has to be with the consent of the owner and without possibility of it using e.g. invents protected by patent. Tacit knowledge concerns undisclosed public technical information technological, trading or organizational being as a company property, to which have been taken activities having for the purpose maintenance confidentiality e.g. tacit knowledge in form know-how [20].

Explicit protected knowledge can divide on three groups what is presented on the fig. 2.12.

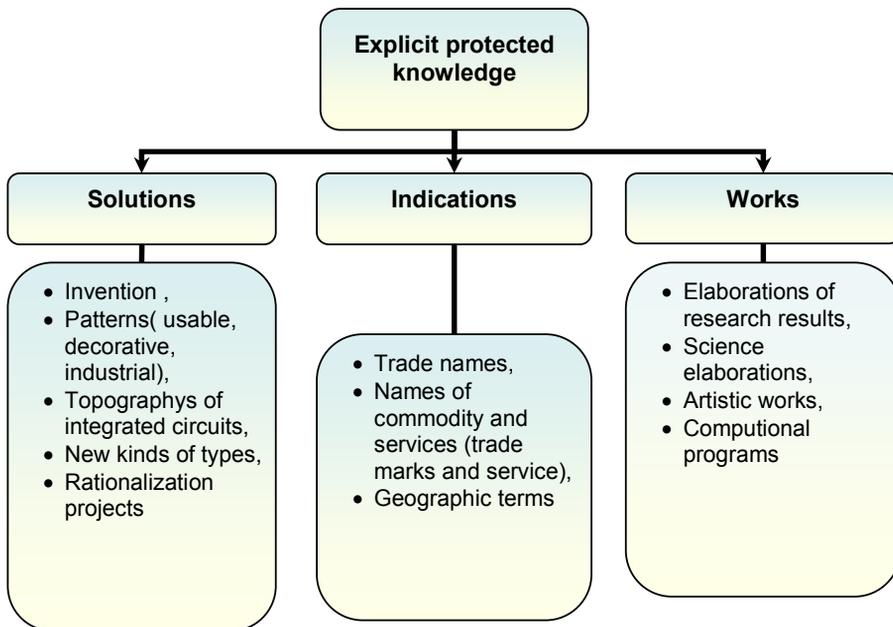


Fig. 2. 12. Classification of knowledge protected knowledge (opracowanie własne na podstawie E. Głuszek: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. 2004, s. 215)

Inventions to be protected have to fulfill three criteria: they have to be innovative and nowhere till now met, they can't result in an obviously new way from the advanced technical level and have to fit to implementation in industry so their using should refer the same effect in every time. Although the invention is protected it doesn't give guarantee of high quality or efficiency. Patent protection subject to some restrictions:

- Is applicable for a certain period of time and in definite area,
- Exhaustion of patent refers to the commodity implemented already on the market by authorized or under his agreement and easy access to it,
- Law anticipates possibility of using from invention without agreement authorized person in definite cases i. m. using invention for the state purpose and using it as researched objective and experienced,
- And prohibition abusing patent in case, when using from invention is necessary to fulfill the market needs or require that public interest (however that limitation can be used after 3 years from the day of got patent).

Legal protection of utility models refers to the new technical solutions. Concerning shape build or summary object with stable form. The same as in a case of invention legal protection connects with exclusivity on using from utility model and drawing on its material and professional benefits. The limitations are also the same. Industry pattern is a concrete product, which uniqueness reveals in a shape, space, features, color, picture or ornament etc. To being protected it has to be original and possible to use in industry. Protection of industrial patterns takes place by registration and connects with exclusivity on drawing benefits. Beside more and more role explicit protected knowledge is getting to have tacit knowledge. Are consisting on it information and skills concerning production, marketing etc., which the company want keep in secret. These are [20]:

- Secret inventions or purposely didn't reported to the protection,
- Technical – organizational improvements,
- Technical documentation and technological, models, patterns, recipes, instructions,
- Trade parameters,
- Computational data base,
- Results of research works,
- Results reached over many years of work,
- Organisational processes,
- Information about economical situation, technical and social of company.

Decision about unpublished the knowledge takes the economic entity, who disposes given knowledge. It takes place through commitment of people to keep secrecy and not revealing it for the other and not using it in own activity.

3. Strategic approach to knowledge management

3. 1. Factors forcing knowledge management

In ten recent years the issue of knowledge management has grown to the size of a serious scientific problem, and specialists from knowledge management have elaborated a wide range of techniques, applications and programs to practical aims. To arise and develop this faculty has contributed to many factors [26]:

a. Information overloaded and chaos.

Overloaded information buries and overwhelms companies and the brains of employees. Finding information needful to realization of tasks, especially that complex, is very often time-consuming and frustrating, especially in case of lack of access to good organized and easily available infrastructure. How observed Serban: [45]:

„This, what we have got, is the huge volume of not selected and unprocessed information. However, this what with big effort we are trying to find is knowledge about ability to quickly react on requirements and expectations of our employees and clients”.

b. Condensation of information.

Condensation of information is a narrow throat of communication in a contemporary computer network. For example, access to the Internet is slow in a time of peak work hours. If existed the mechanism enabling direction on searching information, network bandwidth would be much bigger.

c. Information, segmentation, and skills specialization.

Currently most of the employees are able to master the knowledge concerning only one faculty, and only in some specialized segments. Possibility of access to adequate knowledge in properly time should improve individual and organizational efficiency of tasks solution, mobility and unintellectual resources. Average number of years spent by the employee in one company currently decrease even to three years. When the employee is going to be retired or is leaving to another company takes with itself valuable experience and skills, for searching and training that organization has to additional pay. Sounding from 2001 showed, that average 26% of knowledge in organization is stored on the paper, and 20% in electronically form, but 42 % of knowledge is stored in “brains” of employees. Gaining and sharing the experiences and skills by employees between themselves, enable saving

money, shorting breaks at work and strengthen general ability to cope in situation of personnel lack.

d. Competitors

Ability of predicting changes occurring in environments and requirements of client, and also skills of fast reaction on these changes, it necessary conditions of adaptation for the purpose of surviving and good functioning company. Although big difference, many people confuse term “information” with term “knowledge”. Albert Einstein had warned, that: *“Information is not knowledge. Knowledge is experience. Everything rest – is information”*. Knowledge includes collection of facts and intuitive rules, purchased by the expert in a time of many years. In the ideal case, in relation master – pupil, master share already with this unique knowledge, which comes from experience and it is not in a handbooks [26].

3. 2. Strategies of knowledge management

Rob van der Spek and Jan Kigma think, that the strategy of organization concerning knowledge management should cover two pivotal aspects: exploitation and application of owned knowledge and generating new knowledge and development of skills enabling generate it faster than till now [41]. According to theme to effective strategy implementation of knowledge management necessary is [41]:

- Mechanisms and tools enabling communication between people having knowledge and dispersed in the world,
- Mechanism and tools providing employees access to information about standard solutions and ideas, experiences other people,
- Tools serving development of individual knowledge, thanks which its easier for people to switch on thinking about work as a process of continuously learning.

Adequate system of knowledge transfer in company requires matching method of transfer to concrete type of knowledge. Researches done by Hansen, Nohria and Tierney permit distinguish two different approaches to knowledge management. These are: strategy of codification and strategy of personalization and their differentiation is precisely connected with knowledge division on explicit and tacit knowledge [46].

Explicit knowledge can be codified, stored in data base. However tacit knowledge can be transmitted only by personal contacts. The advantage of codified strategy is easy access to archived knowledge. Whereas the problem is growing when the convince of employees to making a list of own experiences and putting different documents in repositories of knowledge. The method of personalization permits on matching knowledge to the situation and the needs of receiver is less time consuming and employees keep more control over available knowledge.

Strategy of codification - is concretising mainly on technology and gathering (through computer systems) information in data base enlargement, to which employees have easy access. Assuming such a strategy it's going to multiple and effective using of stored knowledge. If in the organization technological orientation was adopted, then the system of knowledge management is treat as the set of properly selected and later used tools of computational techniques having for the task improving the process of gaining, transferring and storing information.

In the companies using strategy of knowledge is largely codified and stored in data bases, where can use from it all having to it free access. Using from this strategy require good knowledge of modern technology and informatics systems. Entrepreneurs, which want to realize it concentrate especially on creating implementation and correct usage data base, computational networks and software [44]. Strategy of personalization – concentrates on people and their knowledge, which develop and share with it by communication with other people. This strategy base on assumption, that the knowledge is precisely connected with human – he owns it, develop and share with other. To transferring knowledge comes usually on the way of direct contacts with colleagues. If are used computational systems, they have only for a task enabling contact. Organization, which takes this type of strategy, is going to create the culture supporting making contacts and transferring knowledge.

Company using strategy of personalization doesn't exclude using achievements of technique. With a big success is being used possibility of videoconference, telephone connection, or computational. Especially this the last barriers let to eliminate connected with distance, or time zones [44].

Comparison of two strategies has been presented in table 3.1.

Table 3.1. Comparison strategy of personalization and codification (A. Pawluczuk: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004, s.26)

Strategy of codification Deliver high quality, adequate and actual information – through the system using codified knowledge	Types of Competitive strategies	Strategy of personalization Based on creative, property advice enabling solution of problems on the strategically level of organization thanks using individual expert knowledge
Multiple using Multiple using one time elaborated solutions being in knowledge acts Relying on big consultants teams precisely connected with company Concentration on generating large incomes	Economic model	Expert knowledge High provisions for avoiding solution adjusted to specific of client activity Relying on small consultants teams free connected with company Concentration on keeping high margin

<p>People – Documents</p> <p>Development of electronically systems enabling gathering, codification and searching explicit knowledge</p>	<p>Strategy of knowledge management</p>	<p>People – People</p> <p>Development of networks connecting employees and enabling theme sparing with tacit knowledge</p>
<p>Big investments outlays in IT, because the aim is connection people using from codified knowledge</p>	<p>Information technology</p>	<p>Moderate investment outlays on IT, which have to help conversation and Exchange tacit knowledge</p>
<ul style="list-style-type: none"> • Hiring the best graduates of high schools • Intensiva group trainings, And also with using training on the distance • Rewarding employees for using and implementing new knowledge to the system 	<p>Human resources</p>	<ul style="list-style-type: none"> • Hiring the best students after MBA, who like to resolve new problems • Trainings on the rules of mentoring • Entourage employees to direct sparing with information to other • Creative solution of problems
<p>Low prizes stimulating high rotations. Low profit margin. Big number of interaction canal with customers.</p> <p>High automated system on customer answers. Knowledge about clients gained from data bases, where are localized any information about behavior of customer groups.</p>	<p>Management relations with customers – CRM</p>	<p>High prizes for specialist knowledge and products. Small number of interaction canals with customers. Answers for the questions giving personal by specialists – low level of automatization answers on questions. Knowledge from customers is gaining by personal contacts.</p>
<p>Andersen Consulting, Ernst & Young</p>	<p>Examples of applications in company</p>	<p>McKinsey & Company, Bain & Company</p>

In practice knowledge management shouldn't be based at all on using only from one strategy. One should be chosen as dominate and the second as supporting. General conditions what about strategy choice are presented in table 3.2.

Table 3.2. General conditions of choice between strategy of codification and strategy of personalization (B. Mikula: *Dokumenty, bazy, ludzie*. Personel i zarzadzanie. 8/2005)

Criteria \ Strategy	Codification	Personalization
Product / Service	Standard Mature	High Level „clientization” Innovative
Predominant type of knowledge	explicit	tacit

This choice is largely depending on level of standardization and matures of product, and also on difference in level of using explicit and tacit knowledge. Each of the strategies have their own pluses and minuses. During choice have to be taken into account other factors such as financial possibilities of a company. Strategy of codification can be very costly, (costs of buying devices and software, continuously actualization of resources, and also implementation of the system, recruitment and maintenance of high class specialists to service computational service and management of information). Using strategies of personalization can also be very costly, especially if the cost will be counted per one client.

In the table 3.3 there are presented exemplary strategies of knowledge management, which purpose is balancing resources of knowledge in organizations in relation to its needs and their characteristics. Other approaches to basic strategies of knowledge management are shown on fig. 3.1. The strategy of knowledge created by cooperation, concern mostly new knowledge for both the company and its surroundings. It characterizes as cooperation with external institutions and doing research – development works for the purpose of creating new, characterized by innovation of knowledge. Can be realized by carrying analyzes of market having for the purpose setting gaps of knowledge, strategically alliances creating new knowledge, cooperation with institutes B+R and universities, outsourcing researches together with personnel rotation. Can also come to the buying new knowledge (e.g. modern technology) [30].

Table 3.3. Example strategies of knowledge management (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s.28)

Authors of highlighted strategy of knowledge management	Types of knowledge management strategy	Characteristic of knowledge management strategy
J. M. Bloodgood W. D. Salisbury	Strategy of creation	The objective of new knowledge gaining is, being basement of creation innovations. Concentration on creativity and experiments.
	Strategy of transfer	The objective is gaining knowledge the most new, occurring in the surrounding, created by the organizations of surrounding. The task of knowledge management system is quickly spreading gained knowledge and its application.
	Strategy of protection	The objective is keeping earlier created and gained knowledge in original and creative state. Counteract not authorized flowing of information.
G. von Krogh, I. Nonaka M. Aben	Strategy of influence	Concentration on existing knowledge. Spreading knowledge between different areas of company organization.
	Strategy of expand	Using of knowledge creating process, but in the areas of knowledge existed in the organization. Knowledge existed in the organization is developed inter alia by using data and information flowing from surrounding area, old the newest areas of knowledge are penetrating.
	Strategy of appropriates	Oriented inside. Through strategically alliances are creating platform to development new area of knowledge.
	Strategy of sondage	Creation of knowledge, new, explicit and tacit, individual and social by the team work, concentrated around free ideas and visions of future area of knowledge necessary to surviving organization in longer perspective.

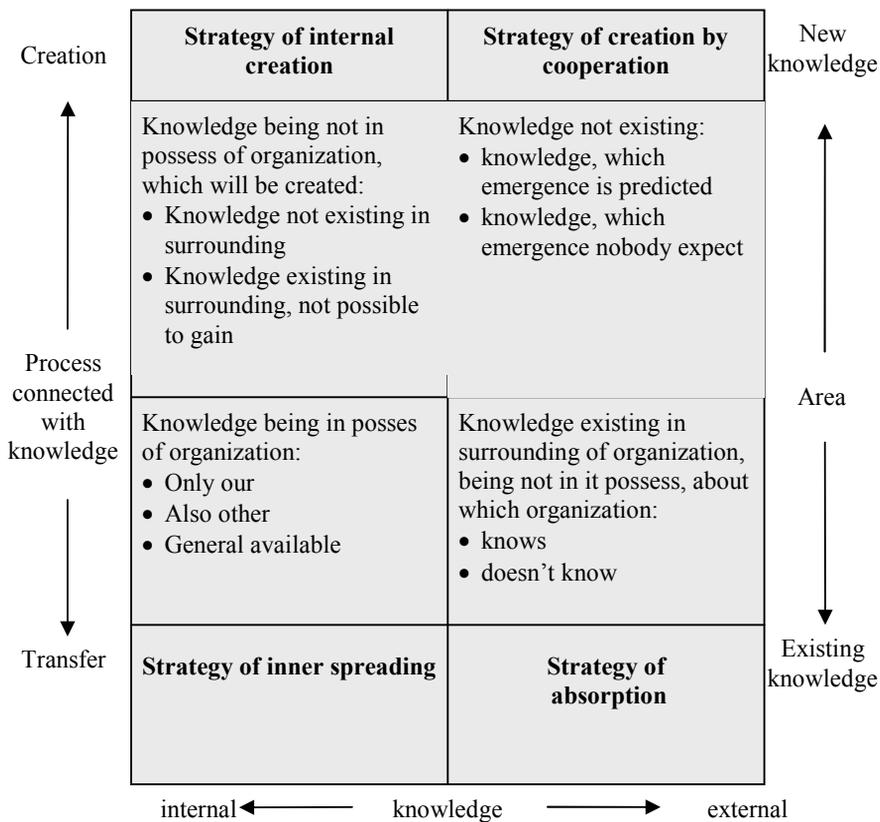


Fig. 3.1. Matrix of strategical knowledge areas (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s.29)

Strategy of internal creation refers to the new area of knowledge for the company, which will be produced by it. It characterizes of running processes to create knowledge inside organization, having for the purpose creation new knowledge or getting new quality of knowledge, in which owned company came on the way of absorption or creation by cooperation. Main process – creation of knowledge is guided inside company. The knowledge can be created in laboratories, internal centers B+R, but also in project teams, quality circles, common practices, etc.

Strategy of absorption is otherwise a strategy of gaining external knowledge. It serves to gain new knowledge, existing in the area by its transfer with using

different methods e.g.: external benchmarking, employees contribution in different kinds of courses and trainings, conferences, by cooperation with customers, suppliers and employees, through buying license, internet, literature studying, rotation of personnel even outsourcing (so the replacement of internal knowledge type know-how the same kind of external knowledge). That is only a part from available methods. Strategy of internal spreading concentrates on transfer knowledge in organization between it different areas of activities and parts.

Knowledge produced during using one or a few earlier strategies are spreading through the network between people, enabling knowledge flowing as its registration. Depending on the types knowledge which were produced (explicit or tacit), are used in this aim different methods: e.g. computational techniques, but also trainings, direct meeting, proceedings, etc. [30]. Awarded strategies should be considered separately. For the purpose of theme is generation of knowledge and common supplement.

If we take into account necessity of protection of owned resources knowledge can still be distinguished by two strategies: favoritism of knowledge and sharing knowledge. Choice one or two strategies, which are kind of opposite, depend on that, if the organization want to protect or share knowledge personalized tacit or explicit, or the codified knowledge. Each of this strategy can be realized in different degree during implementation four earlier described [30].

„Strategically choice constitute searching between existing and new areas of knowledge and main processes connected with knowledge and purposes of company” [30]. In a process of choice the management knowledge strategy is used very often as a concept of strategic gaps, presented on the fig. 3.2 its divergence between this what organization should do, and what is doing in real. Selection of adequate (few adequate) strategies have for the purpose closing of gaps.

Usage concept of strategically gaps, knowledge and relations. Process choice of management knowledge strategy comes to the steps [30]:

- 1) Identification (or formulating) strategy of company and strategy of knowledge,
- 2) Identification (or formulating) strategy of company and strategy of knowledge,
- 3) Creating knowledge vision,
- 4) Analyze of internal company environment (which effect is inter alia creation of acts maps of knowledge company),
- 5) Analyze of external company environment (in that network relation)
- 6) Comparative analyze and establishment exiting gaps of knowledge
- 7) Creation for each of the knowledge gap strategy warranties of knowledge management and establishment necessary to fill gaps of relations, their analyze and assessment,
- 8) Choice for each from basic strategy knowledge gaps and supporting, defining their ranges and time of using.

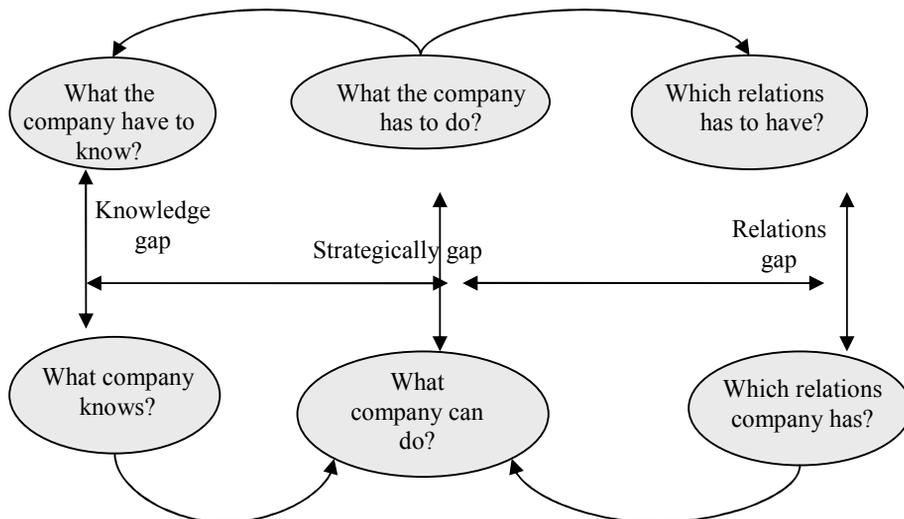


Fig. 3.2 Strategic gap – knowledge and relations (K. Perechuda:
Zarządzanie wiedzą w przedsiębiorstwie. 2005, s.34.)

Choice of knowledge management strategies depends on the development of direction the company appointed through competitive strategy and also on analyzing results, from which result define knowledge gaps and relations. Strategy established in this way of knowledge management and strategy supporting are the basement of methods choice and means of plans realization [30].

3. 3. Models of knowledge management

Literature concerning knowledge management mentions two basic models:

1. Japanese model

Model proposed by Nonaka and Takeuchi is one of the most widespread models of knowledge management. Its based on distinction tacit knowledge from explicit knowledge. Comparing two types of knowledge with each other these can extract four processes of knowledge transformation:

- Adaptation,
- Manifestation,
- Connection,
- Interiorization.

It was presented on the fig. 3.3.

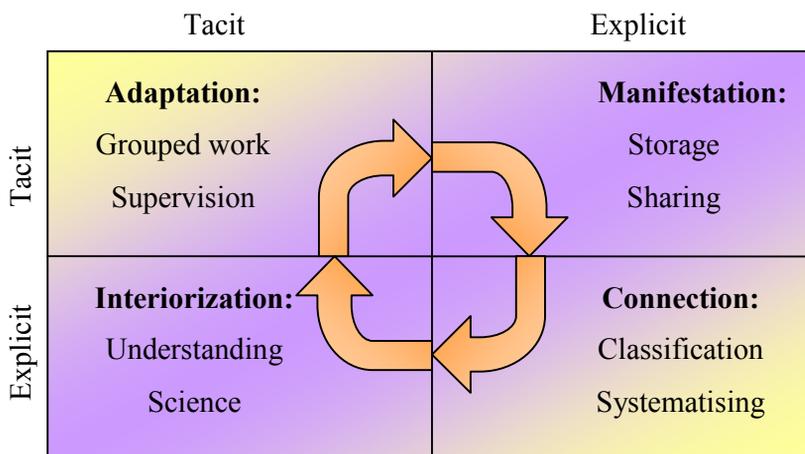


Fig. 3.3. Model of knowledge management acc. I. Nonaki (W. Grudzewski, I. Hejduk: *Zarządzanie wiedzą w przedsiębiorstwie*. 2004, s.105)

Individual elements of model concern both inside company (implementation and integration of new tools and technologies), and also it surrounding (import of knowledge). They concern both present (common solution of problems), and also future (experiments). Element which connect in one efficient and consistent system are key skills [21].

2. Process model

This concept aroused in the first half of 90 years. As the result of researches on industrial companies' innovation Leonard – Barton from Harvard Business School accepted that for effective knowledge management necessary is exiting five elements [21]:

- Key skills, covering physical systems and technical management skills and knowledge employees, and also norms and value systems,
- Common solution of problems,
- Experimentation,
- Implementation and integration of new tools and technologies,
- Import of knowledge.

This model is presented on the fig. 3.4.

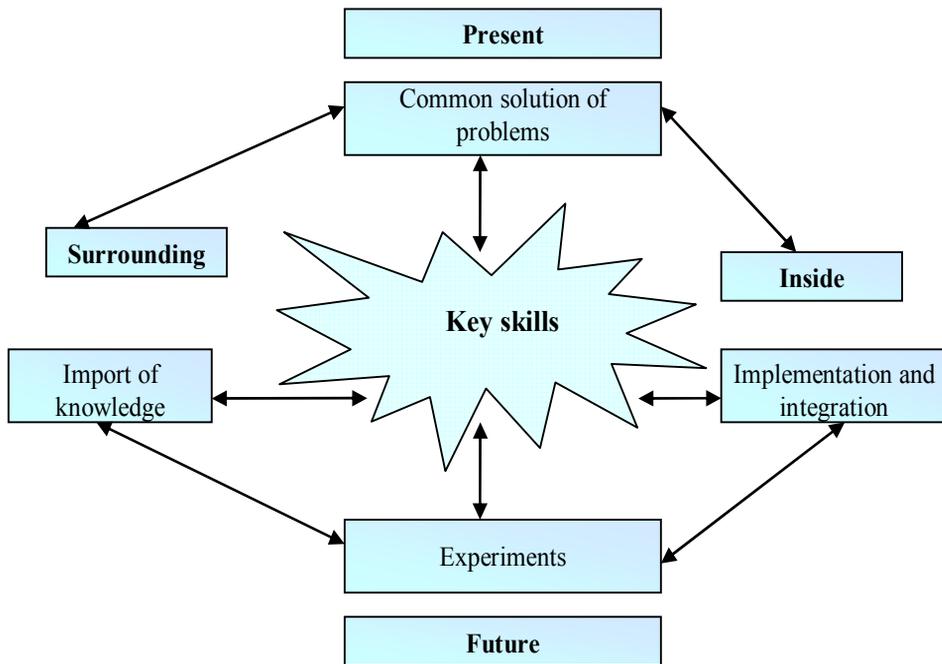


Fig. 3.4. Model of knowledge management acc. Leonard – Barton (W. Grudzewski, I. Hejduk: *Zarządzanie wiedzą w przedsiębiorstwie*. 2004, s.106)

Besides those two basic came into being few other models of knowledge management. These are some of theme.

Knowing organization

Choo has connected theories of knowledge creation with two other strategically information processes and elaborated model called by it “**knowing organization**” [26].

At the beginning, by the process of sense - making, organization interpret data coming from external surrounding and set common interpretation for all it members (fig. 3.5). if the occurrence is a routine, then organization directly pass to the process of decision making, search additional information and analyze alternatives.

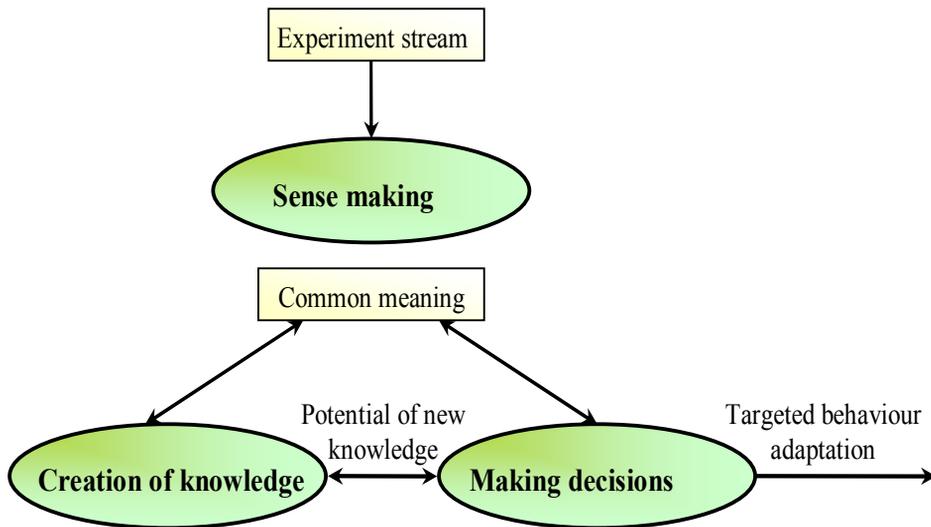


Fig. 3.5. Knowing organization (W. Karwowski: <http://www.ciop.pl/>)

Model of knowledge management Wiiga

The last two models concentrated mostly on processes of creation new or using already existing knowledge. Model Wiig (fig. 3.6.) include wider area of knowledge management effects in organization and extract following four processes [26]:

- 1) **Revision** – appraisal of effects last activities in categories this, what is going to reach (estimation, evaluation),
- 2) **Conceptualization** – view in matter, what is knowledge, what is the state of knowledge in organization and analyze of strong and weak sides of actual process KM (researches, polls, classification),
- 3) **Reflection** – knowledge appraisal according settled set of criteria: choice of optimal correction plan “bottleneck” and it analyze in respect of risk in implementation,
- 4) **Activity** – manipulation of knowledge objects for the purpose of improving business process and efficiency (gaining, distribution and using).

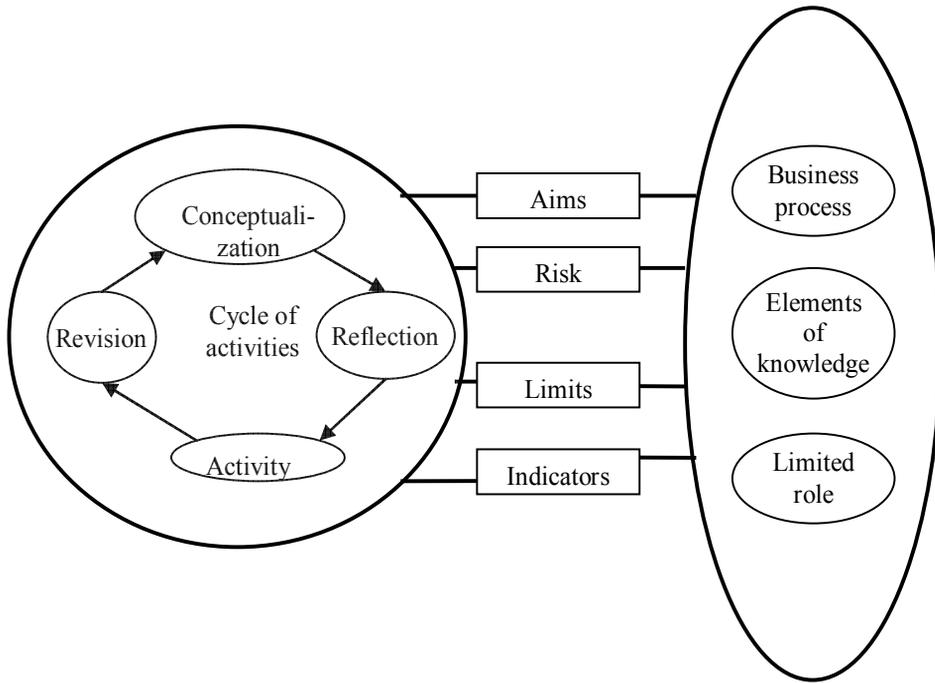


Fig. 3.6. Model of knowledge management Wiig (W. Karwowski: <http://www.ciop.pl>)

On the right side of model are the levels of *Knowledge objects*, according to which business processes are used in elements of knowledge, which are in turn connected with organizational roles. Objectives, risk, limitations and indexes are the **areas of support**, and include:

- Setting “goals” of management knowledge process;
- Setting and estimation “risk”, which can appear in a frame of process management;
- Using model formalism and tools to support concept and limits having impact on knowledge;
- Using “factors” in a purpose of process support and method of knowledge appraisal. Efficient using of KM methods requires favoring that process of organizational environment, and also creating new type of organization.

Organizational model subordinate knowledge

This model (fig. 3.7.) includes basic elements necessary in organization subordinate knowledge.

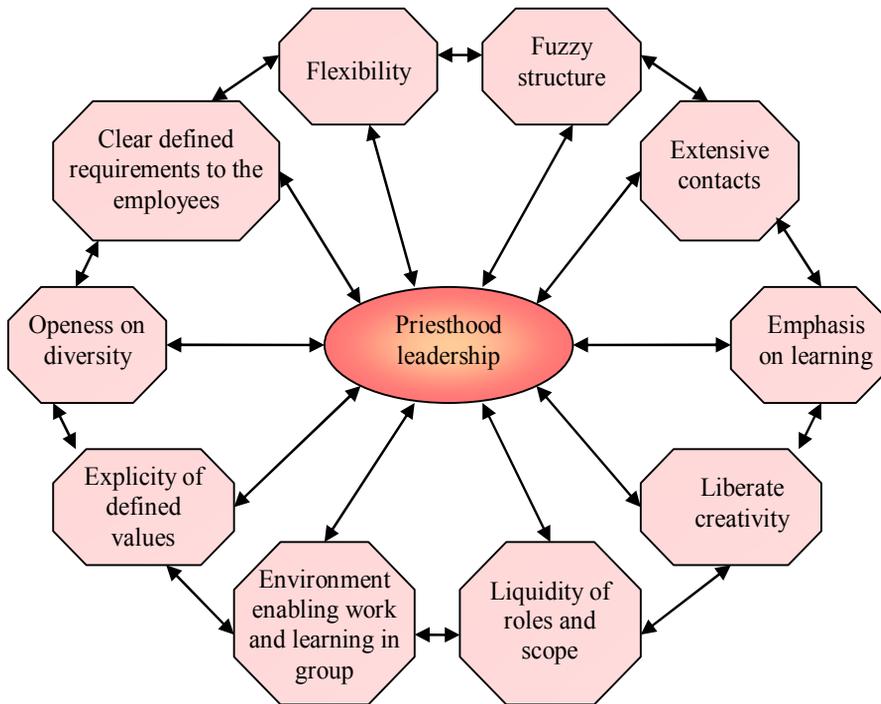


Fig 3.7. Sample of describing the organization subordinate knowledge model (C. Evans: *Zarządzanie wiedzą*. 2005, s.58).

These ingredients connect in whole servant leadership, so this, which have for the task stimulate, facilitate and support processes of generation and knowledge exchange and for which it is a basic task.

3. 4. Chosen methods supporting knowledge management

Base of the best practices – global, central in a scale of all corporation base standard solutions in a scope e.g. making reports, planning tasks and management of projects, different business solutions, etc. provide decreasing effect of duplication earlier committed by someone else mistakes, help to use innovative solutions and ideas. The most widespread software supporting basis of the best practice is Lotus Notes. This technique brings good effects in organizations, in which is atmosphere of cooperation and desire to sharing the knowledge [31].

Base of experts (from eng. Yellow pages) – internal catalogues and external experts places in company Intranet let on people identification, which can be useful in solving concrete problems. It permits also on ruin functional silos, because support networking by the employees different departments e.g. in Ericsson company can in that way easy indentify experts, come through elaborated by theme materials, and even assess their satisfaction from the cooperation with theme.

Case based reasoning - based on computational technologies of problems solving meet in a workflow in analogical way as in cited from historical data base cases, or according elaborated earlier formula. Find using especially in client service, where the personnel not always dispose large experience and not always know how to behave in given situation.

Accuracy of recalls adequate case in adequate situation depend on precision defining cases and on regularity in implementing new cases by the employees “linear”. The example can be Nokia company, which wanting encourage employees to effort in enlargement cases base use bonuses depending on amount of implemented solutions, and also on frequency, with which other employees were using from given registrations. IT play very important role [31].

Coaching / mentoring – care of tutor over employees starting carrier in company. Provide very direct interaction. Doesn’t require support of informatics technologies, anyway science in a form of master/pupil has very long traditions. Usually the guardian doesn’t work in the same department and hasn’t impact on receiving by the “pupil” notes under cycle evaluation. Mentor constitutes first instance for help in case meeting by the young employee difficult questions, mentor helps to peel the right direction of development.

Codes of practice – customs, standard procedure and fixed behavior result from accumulated experience. The key factor and determining suitability of technique is transfer of knowledge and observations of workshop groups members on written formulas of ways behavior work (in a form of checklist, guidelines and handbooks).

Data Mining – technology serving to multidimensional analysis enabling finding hidden dependences between big amounts of data [31].

E-learning - programs serving to teach with application of computational techniques and Internet. E-learning is an irreplaceable tool for many companies wanting to meet the challenges of effective management process learning considerable groups of employees. The possibility of adaptation speed of science to requirements teaching employee, flexibility for time and place of science, and also effects of scale permit on transmission knowledge to the most valuable specialists are only some reasons, for which the companies more often use solutions of e-learning type [31].

History of project – report created during or directly after ending of project describing ways of overcoming following problems. Allow to determine how it came to breaking barriers of efficiency, shorten time of delivery etc. (valuable is analysis of especially unique projects, uncommon). In a case of bigger project making histories

require interview with numerous group of members, which fulfilled different functions on the cross of whole organizational hierarchy. Report should be brief and include transparent enclosed information having impact on activities who read it, even after longer time, employee. It makes a toll of learning on alien mistakes and successes.

Indexing - adding to the materials meta – information enabling classification of materials keep, what makes easier later finds and renewed using of documents by other people. Indexing is very helpful besides searching archived documents, however it shouldn't require from the user too big effort. Otherwise it can discourage employees to overtake additional effort and place document in corporate knowledge base.

Intranet technologies of information delivery (push) - technologies push are responsible for automatic delivering text intended to describe group of receivers. System is responsible for creation on a basement used historically by the user's materials and given personal profile information, according to information which became the next well-fitting to the needs of receivers. The useful solutions are here e.g. delivered by the company Factiva personalized extracts from thematically services, permit on following information about concurrence, interesting markets for employee, technologies etc.

Knowledge Elicitation Interviews – conversations having for the purpose „drawing” knowledge from expert in narrow field and presentation of it in a form clear for layman, without unintelligible specialist dates. Very often meet on barriers in a form of reluctance expert to articulate this he knows. Requires using standard methodology of keeping results and high competences of speaker, to make technique effective. Very often it is connected with creation of expert systems [31].

Map of the best practices – includes information about teams reaching championship in a given field, setting point of reference like also potential sources of clues and knowledge about activities ways. It makes supplement of corporation base yellow pages, fulfill similar function- permit on fast attainment to experts, so to the sources of tacit knowledge [31].

Peer assist – support of thematically group representing – formalized method of gaining help and clues of people out of project team enabling discovering new ways of solving specified technical problems or businesses. This method is using inter alia in BP.

Planning carriers and successors - concern people taking key positions in a company, especially because of own technical knowledge. It includes indication successor enough early before going on pension or leaving because of another reason defined expert, like that to make it transfer his knowledge (also tacit) to the successor. Require promotion of HR department and designating motivates incentives to effective transfer of knowledge.

Searching corporative sources of information – enables on quick access to gather in corporative Intranet data in sequence from the most important (the best

respondent to key words) to less connected with query. Searching data can be made easier through creation of the company thesaurus. More effective using of information resources websites permits also corporative bookmarks, thanks to which employees finding website www with valuable information describing it with few key words (meta-information) and write it in available for the other employees data base. Using from gathered resources is in progress through searching according to:

- Key word;
- Actualities included materials in defined field;
- Compatibility of information topics with dynamic created profile of searcher (profile is creating based on links, from which the person use the most often);
- Giving websites by their “explorer” (given address can be important according given employee for dealing with electronically trade or maintenance rolling stock).

Efficiency of behavior process and then searching data depends in a large measure on the desire of employees to fill bases and places precise meta-information (information about information). In a case of www websites exist software serving to automatically summarizing their content and generating a brief description [31].

Publication of gained knowledge – sharing with gained explicit knowledge through placing documents, reports, video records, or materials not in electronic form is a derivative of open organization culture. The success of such a type of initiative depends on skills of somebody giving materials in a “friendly form”, like that, when the cost of gaining the same knowledge from the other sources wouldn’t be lower.

Reflection – refer to conversion observations in useful knowledge through placing in a context of present and future tasks e.g. in company McKinsey, how in many other consulting companies each Friday is spent in an office not at customer. It has for the purpose not only support of experiences transfer between different project groups, but also leaving for employees little bit time on analyzing through experiences and observations from project and enabling documentation of these observations in after project report “lessons learned”. Require personal engagement, time and financial support enabling participation in courses and trainings.

Repository of knowledge – central place of storage written knowledge with materials catalogued in general known way.

Retrospection / results after project – formal meeting after the end of defined task having for the purpose analysis of achievements and mistakes, drawing results, writing theme and storage in a company repository. Under condition of open atmosphere and desire of learning and to not duplicating once done work and seeking to avoiding repeating mistakes gives important effects.

Instructions and trainings – the most often used method of rebuilding corporation knowledge. Should include spreading knowledge both gained in a scope of own organization and from outside sources. Efficiency and return of the time

investment and funds of the company depend on engagement of employee and fitting training to the profile of given data and tasks done by this person. Internet stock exchange of training services (f.e. Hungry Minds) provides bigger clarity of educational market services, helps to fit service giving the best results. Information about effectiveness of following trainings can be gathered only within the same organization. In both cases it is an important measurement of trainings effects, including ability of employee, start knowledge and other factors.

Systems of queries distribution - tools serve to search for professional answer on employee questions. The most advanced solutions offered by companies such as AskMe, IBM or Orbital permit employee ask the question, search answer on theme among granted already earlier (FAQ), and if this doesn't suffice they direct query to the chosen experts. The employee has possibility to mark the received answer, thanks to which in a natural way is creating a ranking of experts in a given field. Thanks to that such a system permit not only on measurement activity in sharing knowledge, but also in quality grant aid, it can constitute a perfect basement to giving motivate rewards to sharing knowledge. The advantage of such a systems is also a fact, that they enable for specialist control over that, who when and in which form direct knowledge. The experiences of many companies show, that its easier to encourage employees to help for concrete college than placement documents in computational systems [31].

Expert systems – method of know-how codification, so knowledge about, how to do defined activities, based on oriented object concept of artificial intelligence. Permit on replay ways of solutions defined technical problems thanks creation of expert system including knowledge of specialist. Conversion personal knowledge, tacit in explicit and build system requires high qualifications and experiences of person who is doing interview with expert.

Knowledge fairs – in global corporation meetings of represent ants of different departments, presentations their projects, experiences. They are a valuable source of knowledge about activity of rest company cells, permit on direct exchange of cautions, the best practices and ideas. They stimulate cooperation between different departments of company.

Taxonomy – catalogue structure gathered in an informatics system knowledge and information, on base, which is following searching interesting for the user resources. To at least one source password describing the each document its assigned it contents. Adequate fit taxonomy includes all possible problems touched by company documents and provide simultaneously effective searching, even in the most detailed information and knowledge.

Corporate universities – growing training needs of companies causes, that some of theme take over partly or at all the role of educational training centers for their employees. In a companies Xerox and PwC Consulting are organized trainings, lectures on interested employee's topics. The advantage of such a form except

transmitted knowledge is impact on organizational culture through employee's awareness the role of knowledge and sharing with it [31].

Workshops before project – it is a formal process of existing knowledge transfer and the best practices to the members of project team before starting task. It's described as a kick-off meeting. In dispersed geographical organizations it can be leaded virtual by using videoconference and other discussed technologies. The effectiveness of this treatment depend on experts availability in given area delivering important knowledge, solid preparation, calculation time on meetings and informal conversations and interaction (virtual for absents), like also appreciation value of workshop by leadership.

Virtual grouped work – it is an enlargement of videoconference about network application enabling distant employees talking, seeing and works on common shared document. Solutions of this type are available inter alia in the newest versions of program net meeting. This method requires however large costs of equipment and high capacity of links, and their effectiveness is determined also by existing of open atmosphere favor sharing knowledge and cooperation.

Results and summarizing of important events (from eng. After action reviews) – method of writing recognized connection of cause – effect meet in a workflow. Fast and easy listing results of activities, confrontation theme with expected results and drawing results help in a fast and more full understanding of system functioning. Gives good effects, if the teams use technique systematically and direct after given event, if exist atmosphere of openness it permits a constructive critique and is the person keeping eye on quality of records. The value of this method lay also in using experiences of other.

Communities of practices – groups of people, trainees working in described field and in a day meeting with similar problems. Following members very often communicate with each other by means of discussion forums, sometimes are creating also websites devoted issues interesting for following groups. Similar groups existence makes searching and finding knowledge easier, enable also confrontation of solutions with wider group of experts in a given field.

3. 5. Measuring effectiveness of knowledge management and value of knowledge

Designation of adequate measurements of processes with effectiveness knowledge management is an extremely difficult issue, at least from two reasons. At first the subject of this field is knowledge – but we don't know till now, how to measure it directly. It is elusive and ethereal value. Further are discussions on its definition. Secondly: subject, in which is made knowledge management is a company being on economy realities. There are different motives of measuring intellectual capital in a company. The most important among theme is comparison in this regard

with other companies on the market, better understanding of meaning of management and estimation value of accumulated intellectual potential.

Here are some from the reasons of measurement intellectual capital [31]:

- Need to look fuller on the company in uncertainty conditions,
- Pressure of investors – publicised indexes are not always faithfully describing situation of company,
- Intangible assets of company exceed significantly today tangible assets,
- Gathering arguments with engagement of resources,
- Making choices between different initiatives,
- Providing savings (e.g. by implementation of e-learning programs),
- Control of reached resultants (e.g. more accurate decisions, higher satisfaction of customers, effectiveness of process),
- Publication reports about intellectual capital,
- Preparation transaction of taking over and ransom of companies.

It's also important which groups are interested in knowledge measurement and management of it. To the first of these groups belong knowledge companies, which sell knowledge or products or services based on it. The second group interested in measurement made financial directors. They are the most interested how to translate intellectual values on company market value. For this group it is important to develop comparison standards, thanks to which companies will be recognized and classified according to the knowledge assets. The third group of interested made economics. Their researches contribute to explanation if the knowledge in deed contributes to the growth of competitiveness of products on given market and how the companies will be seen as owners of large knowledge [47].

Both in a economy and in a company exist big problems in measurement important values characterizing theme. Its result from the lack of checked and truthfully method of measurement, lack of consciousness of benefits from measurement, etc. it often uses estimations, approximations of values, predictions and statistic models – from insufficient amount of data or from impossible to avoid, inter complicated those organisms. It doesn't mean however stopping the trials to measure effectiveness of knowledge management in a company.

One of the most common approaches to measure intellectual resources is a stream represented by Sweden insurance company Skania. The group of people under Leif Edvinson leadership has shared intellectual capital on three components [47]:

- **Human capital** – so the knowledge and experience of company's employees, and also a dynamic of intelligent organization in changing competitive surrounding, gaining new skills satisfying needs, sharing knowledge with the older seniority employees, creativity and composition of organization,

- **Structural capital** – serving as a incorporation, commission and support for human capital. It serves also to storage and sends intellectual material. In its composition come organizational capital – investments in tools and systems accelerate flowing knowledge and information, innovative capital and capital of processes – processes and programs improving quality of services;
- **Customer capital** – so the ability of transforming human capital and structural in advantage on the market.

Written intellectual values have been placed like that in yearly reports about state of intellectual capital Skania. These reports became the form of changes description in intellectual resources of company. Besides that has been elaborated also tool called Navigator, which had to serve to correcting current activities so as to next values of accounting would increase also intellectual value of company [47]. In program has distinguished 5 areas, which have characterized by different indexes (table 3.4).

In a view of subjectivism presented indexes, it's difficult to find a clear and objective comparison system for many companies. The problem is occurring even by comparing two companies from the same industry.

Proposal to set measurements proposed also by Mark Van Buren from American Society for Training and Development. In this organization group composed of trainees of knowledge management and industry has been worked, in which Van Buren was also working. They proposed a model of intellectual capital management, in which the key factor was elaborated set of measurements. The premise of model elaboration was the statement, that “this, what is not measurable, cant be managed”. Because many companies don't measure their investments in intellectual capital, and more often doesn't own information about results these investments, doesn't realize their potential. This capital can be underestimated, or overinvest mated (investments are not effective or it's difficult to assess their effectiveness) [25].

System of measures created by the Van Buren group has covered two superimposed parts: measures of intellectual capital resources and measures of effectiveness.

The easiest way to gather information, so e.g. number of patents or hired doctor, it's difficult to change it into money value. This disadvantage is deprived one from the easiest measures of intellectual capital company - relation of market value to value accounting of company. Value of market is just the price of stocks multiplied by their number. Its considered that the market measuring value of company over it value accounting, take into consideration value of it intellectual capital. This measure has however other disadvantages – subject to fluctuations and psychological factors affected on the market and can be used only in a case of public noticed companies [10].

Table 3.4. Components of program Navigator (Opracowanie własne na podstawie M. Guzik: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004, s.75)

Area	Exemplar Indexes
Financial	Financial assets, Financial assets per worker, Profit on one worker, Market value, Market value on one worker, Expenditures on informatics technology in relation to expenditures on administration.
Customers	Market share, Number of clients, Market coverage, Number of clients visits, Telephone availability, Index of customer satisfaction.
Processes	Administration costs incurred in relation to incomes, Costs of administration mistakes in relation to incomes of management, Number of personal computers on one employee, Administrational costs on one employee, Informatics costs on one employee, Efficiency of computers.
People	Number of employees, Index of leadership, Index of motivation, Fluctuation of employees, Average length of employees seniority, Number of Training Days.
Development	Index of employees satisfaction, Marketing costs on one client. Training cots in relation to administrational.

In a case of measures effectiveness the pressure is moving – from measurement of own intellectual capital in direction of measurement results of process management this capital. Van Buren proposed model presented on the fig. 3.8. Measuring of effectiveness has to base on measurement of financial profit resulting from usage of knowledge management process. The results of this process can be measurable changes of intellectual capital or just changes of financial capital. About last category, Van Buren put attention on the low usefulness of commonly used in other field's measurements - return on the investment (ROI). Its difficult to estimate for the investments in capital, and thus company can reject investments seemingly unprofitable, during when it could be beneficial in a longer interval of time (from the point of view long-term strategy of company).

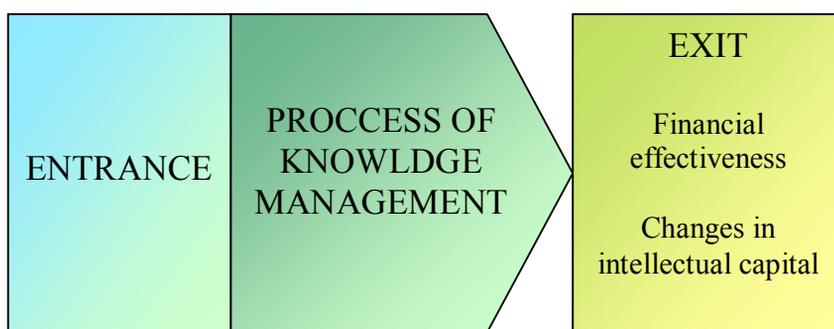


Fig. 3.8. Measure in effectiveness of intellectual capital management (T. Kaczmarek: *Mierzenie efektywności zarządzania wiedzą*. www.centrumwiedzy.edu.pl)

Exemplar measures proposed by Van Buren for the mark of intellectual capital are presented in table 3.4 and financial effectiveness in table 3.5.

The intellectual measures have been shared on four categories:

- Human capital (skills and people knowledge),
- Innovative capital (ability to innovation),
- Processed capital (processes, techniques, tools used in organization),
- Capital of customer (value of company contacts with customer).

Central element has proposed by Van Buren and his model group of intellectual management capital is matrix, in which in a lines are elements of knowledge management process, and in columns – internal factors and external of organization. Thanks their crosscut organization can identify factors necessary to knowledge management [25]. Creation of common and generally used system of measurements is to share information, common definitions, units and methods of measurement. Simultaneously such a system of measures has to enable mark and improvement of company situation, which one of the key strategically objectives and competitive advantage, is using and creation of knowledge.

Table 3.4. Measure of intellectual capital (T. Kaczmarek: *Mierzenie efektywności zarządzania wiedzą*, www.centrumwiedzy.edu.pl)

Intellectual capital	
Name	Description
Behaviour of key personnel	Percentage of key employees detained in a company in the last year
Informatics abilities	Percentage of employees having skills of using basic office applications
Expenditures on trainings in relation to salaries	
Expenditures on R&D	
Percentage of employees connected with R&D	
Freshness of products	Contribution of new products implemented to the market during last 3 years
Satisfied employees	Percentage of employees high satisfied
Satisfied customers	Percentage of customers satisfied with products and services
Quality	Percentage of customer complaints and returns
Average time of contact with customer	
Re - order	Percentage of customers second time purchasing products, services

Table 3.5. Measure of financial effectiveness (T. Kaczmarek: *Mierzenie efektywności zarządzania wiedzą*, www.centrumwiedzy.edu.pl)

Effectiveness
Name
ROE (return on the investment)
Profit on stock
Whole profit of shareholders
ROA (Return on assets)
Increase of incomes
Contribution in market
Market value
Income on employee
Sale new products

Sam Buren himself had estimated, that acceptance by shareholders and companies themselves one system of measurements can take years – the need of many comparison results and data of history, to say easy, are measurements good and evaluate if investments in knowledge management were really successful [25]. Not only can the financial meters show effectiveness of investment in knowledge. Very useful are meters based on effectiveness of realization some sure standard processes in company. One of them is “cost of information”. It describes cost of information flow in company through comparison cost of system IT per single document [18]:

$$\text{Cost of information} = \frac{\text{Cost of document preparation}}{\text{Frequency of second usage}}$$

Monitoring of intellectual capital is especially important for companies, for which the knowledge is a product – informatics capital, consulting or pharmaceuticals. It seems that in case of such a company it is necessary new look on the process of value creation. For the informatics companies, which want to exist on the market gaining one key customer can be a crucial moment in development. In sector, in which the length and quality of reference list translate on average rates, price strategies have to account value of potential possibilities, which open after concrete contract. The companies have to choose sometimes between engagement of key resources for good paying, known for nobody customer and company, which is a less financially attractive principal, but giving fame. The value of brand bounces not only on the position in the customer market, but can also influence on the auction position to suppliers. Market value of company very often exceeds value of it material assets. Market measure immaterial values such as quality of management, brand or intellectual capital of company. There are few tools, which are used to measure the intellectual capital in a company. These tools let to evaluate effectiveness of knowledge management in organization, choose between initiatives, making decisions. The task of managers is the best adequate choice, fit to the objectives and specific companies [31].

3. 6. Technologies supporting knowledge management

In a contemporary world its not difficult to make mistake relaying on resolving all organizational problems through technology, when meanwhile it doesn't have to be always profitable, necessary or even workable. First and basic question, to which there should be an answer, is not that how, but if in general informatics solutions are needful for us. For this purpose has to be answer on following questions [41]:

- What we want to reach through knowledge management?

- How has to look knowledge management in organization according to us?
- Which solutions would fit to organization the best?
- To which support – material and spirit – we can count from the side of management?

If we say that its necessary, then the next stage of solutions concerning this, if we can fit to our needs any from owned systems, will be necessary to buy next – ready product or made in order. On this stage the members have to take into consideration [41]:

- What company expects from the system in a range of its utilization/ functionality?
- Implemented solutions should fit to the needs of users shared on groups with different needs. Usually universal solutions don't check out especially when following employees distinguish much with qualification level.
- Currently experience of company in implementing modern technology. If this is positive or negative?
- Availability – if the following departments connected with teleinformatic platform? Who will be responsible for implementing data? Do exist norms regulating implementing data? Which mechanisms type of archive is needful? Etc.
- Qualifications of personnel – concern the level of personnel qualification and the range of it usage.
- Technical issues connect with answer on questions: if existing network withstand a increased load? If will be able to place new streams of data? How long will be the time of system reaction? Who and in which way will deal with the maintenance and security of system?
- Cult issues.
- Privacy and data security.

Technology cant replace meaning of employees and these elements, as the organizational culture or strategy of company (American experts from knowledge management Thomas Devenport and Laurence Prusak say simply about rule 33,3 perc. If more that one third of time and financial means connected with project would be allocating on technology – project knowledge management turns in informatics project) [35].

In a current time more often against “technology” concept in context of knowledge management operate with concept “tools of knowledge management”. Rudy ruggles from company Ernst & Young describe it as wide defined technologies, which help and enable creation, codification and transfer of knowledge. As each tools, they are projected so as to increase effectiveness of work, through its automatization, causing effective usage of resources there where it is the most necessary. Their basic

task is facilitation of access to information (both structural and nonstructural) and knowledge – in this also so called “tacit”, being in human heads. Indeed, it is assessed that more than half of leadership time and members of project teams absorb administration activities and coordination how also different meetings and update owned information.

To the most important tools of knowledge management include [35]:

Systems of knowledge management – enable gathering and classification of documents; facilitate their searching and access to theme and also registration works performed on those documents (e.g. controlling their version, following implemented changes etc).

Systems of workflow – support realization of procedures for dealing with documents; knowledge base and mechanisms of extraction information included in these systems help in gathering materials necessary to creation of content (e.g. pointing on used low rights or similar records in last done documents).

Systems of support groupware – enable free flow and sharing with knowledge. Their basic objective is to provide to employees good cooperation, which results in creation process and knowledge transfer. They let also organize work of team on three ways. At first they do available information resources of company for each of group members. Secondly, follow workflow so that each from the group members, whatever on change it localization work on the newest available version of project. Thirdly, groupware programs constitute platform to interactive communication and discussion.

Exemplar functionality of grouped systems of work for information knowledge presented below:

- Post expanded electronically;
- Service of calendars and timetables;
- Remote access through Internet and mobile phone;
- Visualization of data – imaging;
- Service of faxes and pagers;
- Expanded sending news together with their divisibility;
- Defining and management of workflow;
- Adequate level of security.

Intranet – can be described as an internal internet. In contrast to Internet network corporation portal – enables summary of information in one place coming practical by all data source existing in organization (can be both structured data and unstructured (e.g. in a form e-mail or video recording). Access to information is in progress by means of internet browser.

Data warehousing – these are easy available, complete bases (repositories) of data, which content comes from many sources (inter alia from informatics systems already functioning in company); they let on formulating new queries, creation reports, analyze resources usage, reasons for the decisions being as fundament for strategically considering.

Systems support decisions, expert systems – these are interactive computational systems used in fulfilling planning function and decision-making. Enables leadership gaining, selected, condensate and examined information and facilitate making non-routine decisions.

Except that can be named [41]:

- Devices to videoconference – permit on limitation costs connected with business trips;
- Devices to telephone conferences and sending news;
- Electronic post – permits on contact between users dispersed in a whole world. It exists also a dangerous “avalanche of unwanted e-mails”;
- Virtual cafeteria – that are places in computational network letting task teams on exchange their opinion, knowledge, information and ideas;
- Information portals – websites in internal networks, to which employees being in the field can reach for needful information. They permit also on creation by employees personal websites;
- Internet cameras – thanks theme can be placed in person, with who is a need to talk. Exist danger that will be used without limit and people will have feeling of encirclement by the work.

New class of tools makes systems which serve to knowledge transferring, especially products which enable remote teaching with using computational techniques (discussions on-line). Currently are also works with preparing solutions based on XML (eXtensible Markup Language) to documents management. The idea relies here on conversion of all documents connected with company functioning – in a format XML, what provide their transfer between different kinds of company. It can be done as a rule of components. The aim is reaching possibility of exchange data invisible for users [35]. During implementation of tools supporting knowledge management can reckon with relatively big expenditures – both on creation tele-informatic infrastructure (buying equipment and software) and implementing activities relayed on endarterectomise communication processes, searching and categorizing available information resources etc. After first wave of expenditures has been arisen infrastructure, will require maintenance, what will carry also with it many costs.

Technologies supporting electronically, asynchronous cooperation

If the team geographical dispersed has no possibility to meet direct, importance of exchange, possible experiences in virtual space much increase. Building then also trust in a group in which play important role. On the software market is available different application destiny to support team work. The most important belong to Lotos Notes, Outlook/ Exchange, Oracle, WiseGroup. They enable sharing documents and conducting asynchronous discussions. This software can be treated

mainly as a tool supporting process of sharing tacit knowledge, but the choice and discussion about explicit knowledge create in some sense common practicing.

Technologies supporting synchronous electronically cooperation

Although, development of more advanced technologies, sending texts is still very useful form of communication. It happens because of small size of information and high speed of their transfer. In connection with possibilities of websites www and free kind form of text connectivity (e.g. electronically post, internet communicators) is getting the system, in which computer is connected to the Internet is able to replace meeting of people, who want to work and learn together.

Audio transfer

Is one form of conference conducting thanks using internet technology? It can be treated as a telephone development systems and radio communication. Currently are there many programs available enable communication in the identical way, as traditional telephone? Belong to theme known in Poland programs Tlen or Skype. Internet telephone becomes more intensive developing media of communication and cooperation.

Conferences of data

Can organize by using virtual board – tool reminding graphical editor, in which document can be edited by all participants. Changes drift by one of theme are directly visible for all. Another effective tool of conference is traditional common using folders. Development of this idea is sharing application, which lets for the users of conference edit common documents.

Growth possibility of data transmission result that it became real simultaneously sending voice and picture in a real time. Such a form of idea result. Those participants of speech (two or more) can see and hear each other during tone of connectivity.

Video conference

Can share on few types, because of usage, realization of connectivity, topology, and of meeting. According to the way of are distinguished connectivity realization videoconferences type as:

- Point – point – the easiest way of connection of two video terminals
- Multipoint – constitute free connectivity three or more video terminals
- Broadcast – rely on transferring information delivered by video terminal one of the participants to all left.

Taking into consideration topology of connectivity distinguish videoconferences:

- Centralized – rely on transferring data generated by video terminal to proper transition multipoint control unit in mode point – point,
- Decentralized – where video terminals pass data direct to the place of destination,
- Hybrid – constitute connectivity of earlier named kinds of teleconferences, in which the role as bridge between centralized segment and decentralized play MCU.

Mobile technologies of work and cooperation

Mobile technologies are new kind of technology. Their development is connected with dissemination of internet technology and mobile devices, such as notebook, palmtop, mobile phone. System of mobile work makes equipment and software, which enable person or group of people work in dispersion and using from knowledge gathered in defined center of knowledge through mobile terminal. Access makes easier s.c. mobile applications or s.c. mobile portals.

Mobile cooperation can be both in a mode of synchronic communication and asynchrony. Asynchrony cooperation enables i.a. sending SMS, e.g. through Internet. Synchronic cooperation enables WAP technology providing access through mobile phone to internet application. Systems supporting mobile work permit on:

- Management of personal information, in this access to calendar, contacts, tasks and electronically post,
- Review, creation and edition existing documents, spreadsheet and presentation,
- Cooperation with informatics systems existing in the economic organization, made available actual information,
- Access to the knowledge through portal.

Modern technologies of communication through Internet influence on rising new forms of work called also telework. Telework doesn't addict place of work to the place of employer. Global world organization of telework European Telework Online distinguishes the following forms:

- Home telework – employee works at home instead of coming to the office or client,
- Mobile telework – employee make his work in a travel or is serving services direct at the customer,
- Telecentras – local offices for a people, which don't want to work at home, but also want to avoid the costs, waste the time and discomfort of going to far away place of work,
- Telehuts – provide access to small local community, letting on keeping social contacts, which can deprive telework at home,

- E-commerce/e-business – makes functional change of service localization from earlier located at the customer or executor on delivered remotely.

Exemplar of telework can be i.a. works done by virtual front office, in which selling, being in progress earlier, can be thanks to electronically cooperation realized by the phone or computer. Another example is consulting done earlier on the place at the customer, which can be served from free place in the world thanks chosen system of electronically cooperation.

Technologies support extracting new knowledge from resources of explicit knowledge. Searching possibilities of analyzing large collection of data lead to the new technology of transforming data known as a name Data Mining. Exploration of data is a process of extracting information (knowledge) from data base, consisting of organization resources.

Tasks of data exploration

Basic tasks of data exploration are:

- Segmentation (grouping) – yielding from data important business information,
- Detection connectivity and sequence patterns (important in a systems of relation with clients, such as CRM),
- Classification – yielding common features of objects (e.g. in scope of group, such as products or clients),
- Predicting values (e.g. size of sale, demand on defined commodity, behavior of clients) with the mark of probability.

Methods of data exploration

The most used methods of data exploration:

- Visualization,
- Statistic methods,
- Induction,
- Neural networks.

Visualization – serves to disclose knowledge thanks graphic presentation. The most often used group of data exploration is **statistic method**. They find application in an initial analysis e.g. to group and identification factors of forecasting. Although continuous development of these methods, statistic analysis is unfortunately insufficient, especially in a case of large amount of factors and unliterary problems.

Induction – relays on taking results from specific facts for a purpose of hypothesize. Facts in data exploration are records written in data base, and hypothesis is usually a decision tree, which tries to share data in a reasonable way for a purpose of creating generalizations (rules) with nodes serving as decision points.

Neural networks – are the newest class systems of artificial intelligence of expert systems. Their characteristic feature is an ability to learn individually making tasks on a base of own experience. The main ingredients of this system class artificial intelligence are neurons responsible for transferring many input signals on single output signal. Model of occurrence, object is neural network, i.m. group of connected neurons. Structure and self-organization of such a network is made during learning and gathering experience.

To use advanced tools effective to data exploration, their user should dispose basic knowledge from the scope of data base, machine learning and artificial intelligence. Methods of data exploration are available in a frame of standard functioning of system data base (e.g. Microsoft SQL Server, Oracle). It enables integrated application serving to implementing and searching data with tools to their analysis and supporting decision making.

Exploration of data from text documents

Resolving problem of knowledge yielding from text documents are described in techniques of automatic analysis of natural language defined as Text Mining. It include: searching information, building thematic groups in a large collection of documents, visualization of document content, extraction of structured linguistic expressions, automatic generation of abstracts and reports from document content [11].

Exploration of knowledge from www system

Exploration www resources is defined with Web Mining and Web Farming expression. This term defines collection of activities having as a purpose using resources of Internet to continuously and systematic collection of business information, important for current working company. Especially important task in Web Forming is systematic collection of economic information with using Internet. Data can be gathered in data warehouse. It should be realized in connection with other existing in organization methods of knowledge gaining and operating it.

Another approach to knowledge exploration from system www is Web Mining. In area of this approach distinguish:

- Web Usage Mining – WUM,
- Web Content Mining – WCM,
- Web Structure Mining – WSM.

Technology supports learning

Learning of organization is going in a form of continuously increasing qualification of individual employees and teams. Realization of this process in

effective way require also reaching for the newest technological solutions, which are learning with using computer /electronically learning – e-learning, e-training).

Using informatics technologies lead to different forms of knowledge passing and skills in a process of learning. Usually seven forms of learning are distinguished:

- Self-improvement with using electronic materials – individual work with material course, available in network only with instructions and test of self-marking.
- Virtual lecture – presentation based on conference services, done by lecturer.
- Training done by learning alone or in a group.
- Project realized alone or in a group.
- Searching information.
- Seminar, discussion group.
- Consultations based on technology of teleconference.

Taking into consideration used technologies distinguish following categories e-learning – from the most basic to advanced:

- Systems of data base;
- Support online;
- Asynchronous trainings;
- Synchronous trainings;
- Blended technologies;

Evolution of technology is creating internet application as a tool to available knowledge.

Growth of information volume presented through internet www service, which happened together with development language HTML, has led to website creation grouping topic websites www. Development of technologies on internet portals and their using a Internet lead to specialization of portals. Taking under consideration criterion of information content offered by the portal such portals are distinguished:

- One topic – vertical (vortals);
- Multitopics – horizontal (hortals);
- Corporate.

Taking example from these portals organization have found new ways of communication with employees and surrounding have started to do own portals, called corporate portals. The difference between corporate portals and earlier defined internet portals rely on i.a. narrowing group of corporate portal users to employees of economy organization and it employees. Portal available knowledge, services and software used in organization. Makes the tool of integration access to knowledge organization.

Types of corporate portals:

- **Portal B2B** is an acronym, which comes from Business to Business. This term means whole relation between companies. Solutions B2B have as a purpose improvement of relations and processes between company and their business partners.

They fulfill mostly information function – source of knowledge for the partners of company.

- **Portal B2C** is acronym of Business to Customer. It means whole relations between company and their individual clients. The task of portal B2C is building and maintenance the best relation with clients of organization and gaining new clients. Corporate portal B2C similar to portal B2B available for the users expanded information functions, transaction-clearing, and also knowledge according to it profile.

- **Portal B2E** – Employee’s portals, business to employee portals. Called also knowledge portals, are systems supporting employees dealing with knowledge in access to it. For the organization portal B2E is a central start point for each of its employees. Main task for B2E is to give its users an effective and efficient tool, thanks to which they will be able to do their work easier, faster and also much better. It is possible thanks this, that the portal offers to the employee a wide range of knowledge, applications and services in one place.

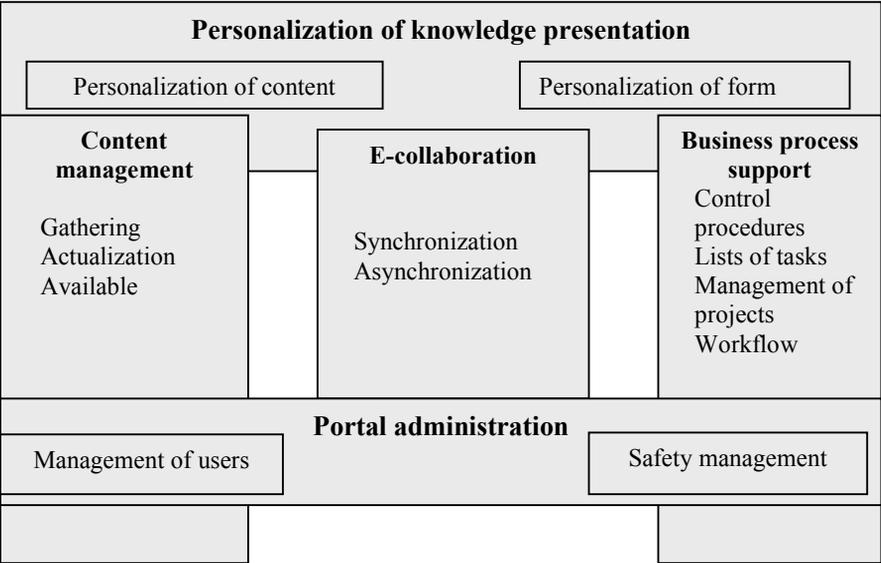


Fig. 3.9. Functionality of corporate portal (A. Sobczak: *Narzędzia informatyczne wspierające zarządzanie wiedzą w instytucjach sektora publicznego*. www.egov.pl)

Informatics technologies in knowledge management systems of new generation

To cope with requirements of adaptation to the changing reality (learning new reality and working in it), and even – what is more effective – anticipation changes, system of knowledge management should have some elements of self-knowledge or – formulating it generally – in ability to evaluate. Only then the cooperation of

organization members can improve activities effectively, enable learning for individual people, and teams and whole organization. Improvements in a system of knowledge management have to concern both work of employees creating and transferring knowledge, like also informatics tools, which they use. These improvements can be treated as a process and result of intelligent behavior, cognitive process or learning. System of knowledge management should become an intelligent system – learning from surrounding, anticipating changes, and adapting to predicted changes. Currently, the term "Cognitive Systems" is used broadly to refer to the technologies that range the spectrum of AI, Expert Systems and Human Machine Interaction. A more delimiting definition is offered that it describes a Cognitive System as follows: A Cognitive System is one that utilizes psychologically plausible computational representations of human cognitive processes as a basis for system designs that seek to engage the underlying mechanisms of human cognition and argument the cognitive capacities of human users, not unlike a "cognitive prosthesis. In this definition, emphasis is placed on psychologically plausible machine-based representations and it is this emphasis that is believed to be important in distinguishing a new family of technology solutions from the bulk of ongoing activities in AI, expert systems, intelligent systems, agents, etc. [40]. Assumption, that knowledge in organization is gained, transferred and created in a process of common working team of people (eventual with computer) constitutes basement to enclose these processes as a tasks realized through the system (systems) intelligent (learning). Modeling system of knowledge management in this perspective its worth to user roles describing defined processes connected with knowledge (business processes) and their participants. Distinguished cognitive systems (agents) can fulfill separate roles in management and using knowledge and realization business processes by task team (group). Complex informatics systems, which are knowledge management systems, can be seen, model and realize using achievement of agent approach.

Thanks that SKM can be treated in organization as multi-agent systems. Multiagent system is a collection (community) of agents, and agents creating SKM can be treated as cognitive systems (intelligent). As a agents in system of knowledge management its worth to treat people and computational systems available knowledge. Each from distinguished cognitive system can be agent working in own environment. Agents in a multiagent system usually share tasks with the other agents and include theme to the realization. Cooperation of agents means sharing with knowledge and make available own functionality.

Teaching agents (artifacts, people, groups and whole organization) is a difficult task, it requires using many methods. Classical methods of organization learning, traditional methods of employees training, machine methods learning, and also classical methods e-learning have met many limitations. So because of that an idea of connecting different techniques of learning in s.c. blended system of learning has occurred.

Learning in multiagent system is a process realized by the agent in some community. It depend on the information exchanged between agents, common established marks of environment, commonly accepted in a given norms environment and social convection and cultural regulating and limiting behaviors and interactions etc. some agents can imitate, give direction or enable process of learning given agent.

Methods of person learning and programmed agent in multiagent systems.

Many possible form of learning issued in multiagent system exist and many criteria of its classification. To the basic criteria in machine learning belong:

- Used by the pupil strategy of learning,
- Using by the pupil feedback value information,
- Aim of process learning,
- Required in a process of learning interaction between agents or agent and environment,
- Number and compatibility aims in agents learning.

Taking under consideration used by the pupil strategy of learning among methods (strategies) of learning can be distinguished [27]:

- Direct saving knowledge in a memory – Rote Learning,
- Learning by Being Told,
- Learning on the examples or practical,
- Learning by analogy.

One of the combinations from learning methods is learning by doing. To these methods belong more and more popular simulation methods enabling learning and mark of skills. Its essence comes to support learning in created for theme which needs artificial and simplified environment of work. To the most important methods of simulation used in trainings belong using strategic games or traditional simulation methods, or computational games. Simulation and games can included to the training plans, what make training strategy richer, accelerates process of employees learning, teams and whole organization and improves effectively of it work.

4. Implementation of knowledge management concept in small and medium companies

4.1. Role of knowledge management in small and medium companies

Small and medium companies (MSP) have found especially lately in a center of interest different organizations and power, as a potentially the most developing. In report about economy state from 2000 we read: “one from characteristic features social-developing and economical changes of last decade is dynamic development of small and medium companies” [34]. Nothing surprising then, that the sector of small and medium companies has a large meaning for polish economy and from its development depends in a big degree situation of country. These companies have a big ability of self deciding and have ability to adapt to the changing conditions of surrounding.

In the last twenty decade way of seeing immaterial resources has changed. At the torn of years 70 and 80 of last century has come to the change of efficiency concept on the competitive concept of company. In this time also people started to use terms like “human resources of company” and “management of human resources”. Techniques of human management has changed, the meaning of business ethic consciousness responsibility of social managers has increased. The human became the key resource of company, and also basic factor of competitive advantage [40].

Companies of future change their approach to human resources. Its visible approach to management “hard” oriented on tasks to “soft” management, which is oriented on people. In a place of traditional methods of management more often has become modern concepts f.e. intelligent organization, organization based on knowledge, learning organization or integrated management (fig. 4.1). All these concepts say, which the success of company base on using intellectual capital, because the processes which are in theme are depended on the use of knowledge and competences of human resources. On the figure 4.2 is presented concept of organization based on intellectual capital [30].

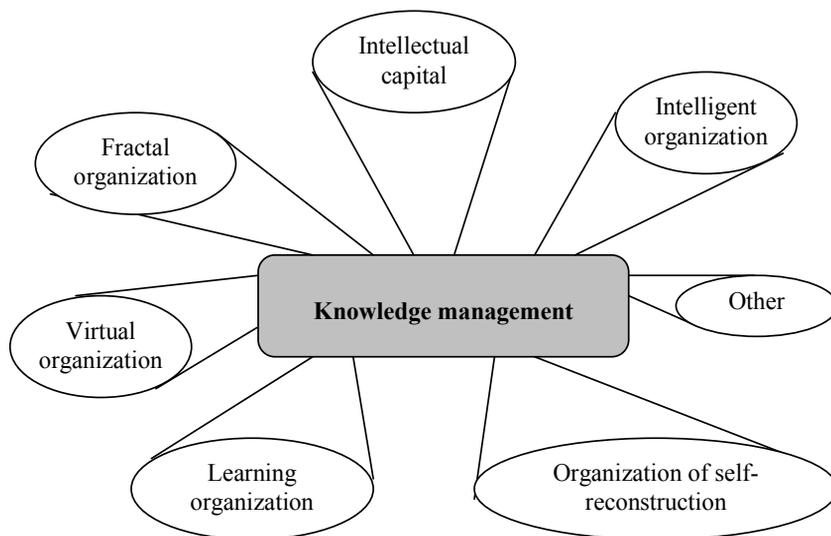


Fig. 4.1. Knowledge management as a fundament of functioning small and medium companies (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s. 173)

Level of organization	Relation capital		Structural capital		Human capital
	Nearer	More far	Consument	Organizational, processes, innovation	Creation of added value
Level of team	System of work	Organizational culture	Synergy of individual knowledge potential		Social skills: <ul style="list-style-type: none"> • Grouped work • Building teams
Level of unit	Genetic inheritance	Level of knowledge	Attitude, intuition, spirituality		Skills and experinces

Effectivity
Synergy

Fig. 4.2. Levels of management intellectual capital (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s.174)

Efficiency of small medium companies is in a big degree conditional on immaterial management resources, in details on competences management, organizational culture, and knowledge management.

Managers of small companies should put attention on 3 levels of intellectual capital in organization presented in the fig. 4.2 first rely to intellectual capital of unit, which consist of factors result from:

- Genetic heritage,
- Level of education,
- Attitude to life and entrepreneurship,
- Experience.

It is not repeated, it can however have an influence on it especially through shaping attitudes towards life and entrepreneurship but also through culture e.g. organizational culture or system.

In companies from sector SMC main pressure should be put just on maximal using of knowledge following employees as a units, development of their knowledge, creation adequate organizational culture adjusted on innovations, creation adequate systems of work and continuously learning. Resources of knowledge permit on building competitive advantage of organization. It refers especially to the companies services, connected with information flow but also indirectly to all companies, which want to build their advantage on avoiding and exceptionality. Organization which wants to be successful and for which it is important effectiveness of activities should concentrate on development and motivation of employees, who are the main element of organization. Adequate selection of people and experiences of employees is important. Especially in small companies it is important to do politic based on long timing cooperation with employees and adequate building carriers based on good precised objectives, common both for employee and for company [30].

In the last years the employers of small companies started to recognize that knowledge of company is more important than traditional resources. Because of problems with access to financial resources and expensive credits more attention has started connect to other methods of gaining and building competitive advantage.

To the most important factors deciding about success of small companies of feature belong:

- Enough capital,
- Use modern method of management,
- Increasing access to the modern technology.

In a process of knowledge management implementation in small and medium companies identification is necessary in key employees, distinguish one:

- Long internship,
- High level of education,
- Large experience of professional,
- High professional of skills and interpersonal,

- Creation of new knowledge on position of work,
- Common contribution to reaching synergic effect in team work.

The issue role in organizations from the sector SMC play specialists, having large experience and very good contacts with customers. Their eventual leaving is connected with decreasing resources of company knowledge. It is a necessary and also adequate mark of company personnel from the range of creation new knowledge. Employees and managers having less meaning for functioning strategic company can also take part in gaining new knowledge. With them have to connect concept of knowledge management in company, because timing employees don't connect emotional with company are not able in a longer perspective to create original knowledge for company.

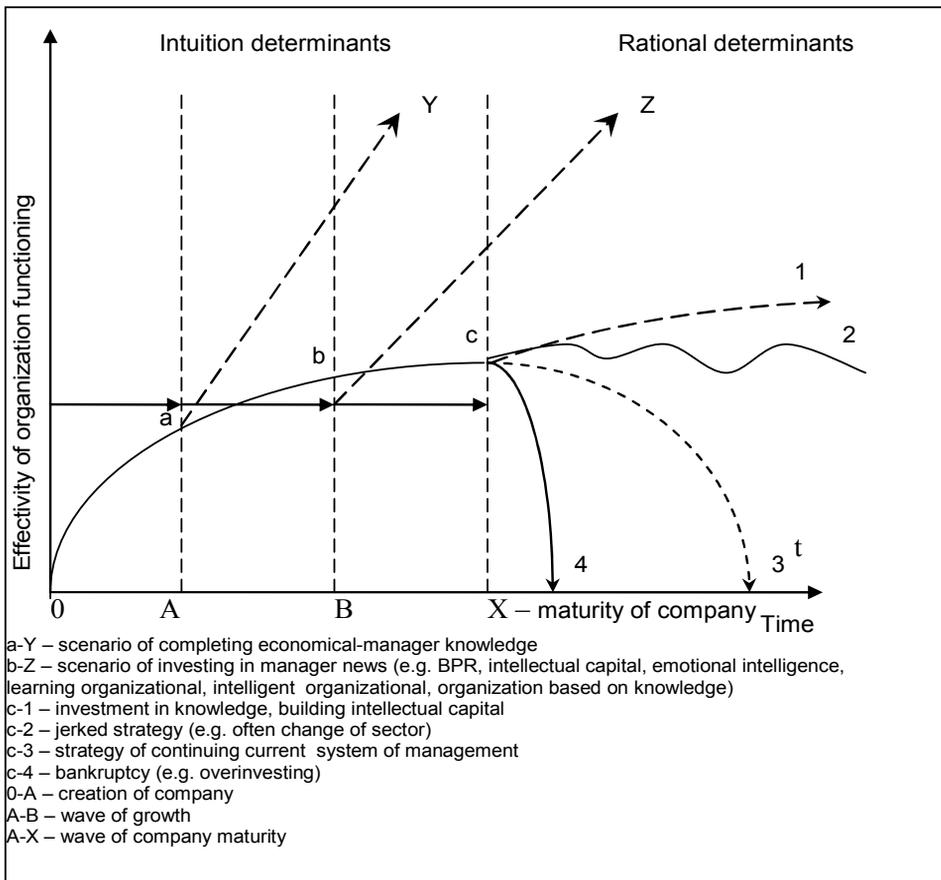


Fig. 4.3. Strategic scenarios of knowledge development in entrepreneurship organizations (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s.180)

On the fig. 4.3 scenarios of knowledge development in company are presented. It seems that the epoch has gone in which intuitional determinants decided about the success of company. Their place took rational factors based on knowledge. Only investing in knowledge and intellectual capital of company can contribute to its effective functioning.

For activity of small companies to bring benefits changes have to be done in some systems of values. It is characterized [30]:

- Going away from intuitional methods of management,
- Resignation from relying only on intuitional knowledge of company owner,
- Reduction of external knowledge usage, explicit and borrowed,
- Investing in own immaterial resources,
- Building internal knowledge, tacit with own strengths.

One of the basic processes of knowledge management is creation of its resources. It can use internal sources for this purpose in a form of employees, data bases of company documentation and external sources such as suppliers, customers and cooperates.

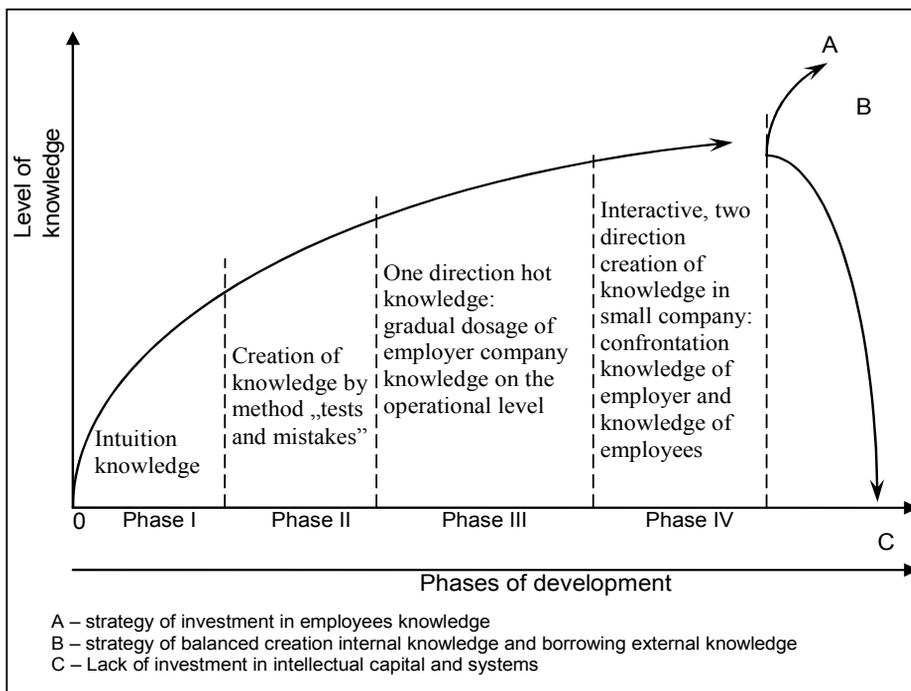


Fig. 4.4. Phases of knowledge development in small polish company (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*, 2005, s.185)

Knowledge generation depends on people because they have the biggest impact on knowledge gaining, creation and transferring it. Effectiveness of company will be very limited if it doesn't take into consideration needs of gaining and knowledge transfer by employees. The problem relies on this, that in small companies employees are not keen and rarely share with knowledge and skills [30].

Knowledge in organization born slowly and in stages. On the fig. 4.4 are presented phases of its development. Creation of knowledge should be seen as building an internal competences of the company. If the knowledge have only units it becomes dispersed and not so useful, however if become grouped knowledge can increase and possibilities of the company become competitive.

Creation of new knowledge in small and average companies connect with continuously and uninterrupted improvement of organizations and employees. Production of new knowledge, gaining it from other and sharing with other has to be processed so as to be adapted to the needs of small company. In small companies can observe difference between owned knowledge by the employers of companies people and their employees. It has been illustrated on fig. 4.5.

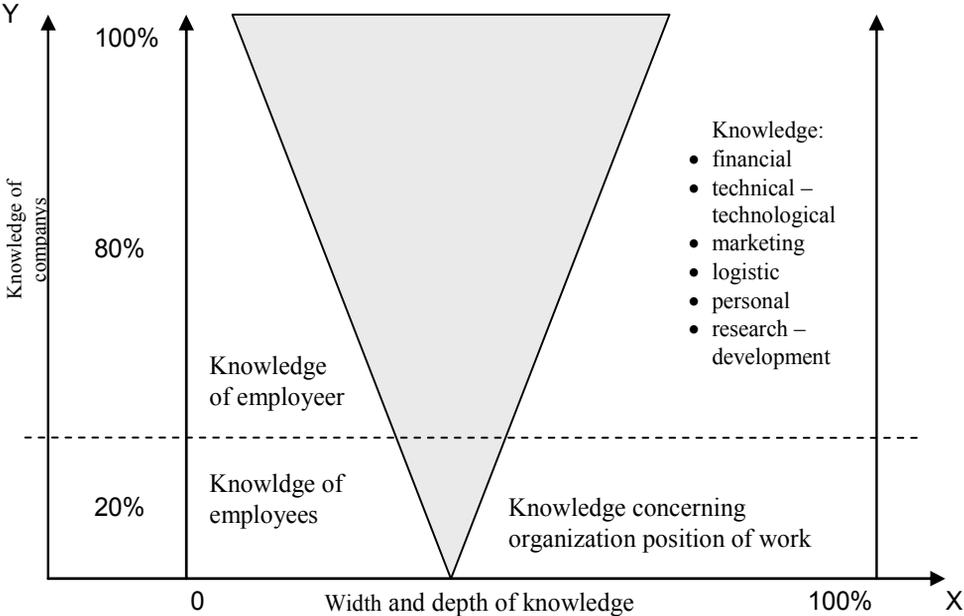


Fig. 4.5. Asymmetry of knowledge in small company (K. Perechuda: *Zarządzanie wiedzą w przedsiębiorstwie*. 2005, s.185)

Despite big chances resulting from existing not so big groups, facilitated way of communications, bigger flexibility of company from sector SMC in small degree evolve in way of intelligent organization, in which comes to accelerated accumulation of knowledge and where all changes in organization space use are to reach measurable benefits [30].

Table 4.1. Possibilities of conversion small and medium companies in intelligent companies
(L. Białoń, M. Zagórska: *Przekształcanie MŚP w przedsiębiorstwa inteligentne*. *Ekonomika i Organizacja Produkcji*, Nr 4, 2005, s.67)

Criteria	Features of intelligente company	Features of modern SMC	Initiatives, possibilities of conversion SMC
Organizational structure	Flat, dynamic, emphasis on competences	Lack of efficient functioning organizational structure, dependence on one right argument of owner	Building task teams
Strategy	Choice of development company strategy with Assumption dominant role of knowledge	Recurrent lack strategy of action, shortsighted activity including part-time Wight with competitors	Building relation with customers (CRM), partnership with suppliers
Products and innovations	Continuously technical innovations and organizational beside participation of employees	Limited transfer of technology, small product innovation	Gaining specialist, transfer of technology, implementation of ISO norms, using from researches of sphere B+R, organizational innovations, building product brand, (even in case of local market)
Management of human resources	Human capital – basic value in company	Perception of human as added to the machine, Lack of incentive motivation	Investment in human capital: trainings, increasing qualifications in a place of work, help programs, adequate system of motivation, using knowledge of people

Organizational culture	Style and character of company functioning with high quality, manifested in behaviors and reactions of individuals group units, language it is also material subjects	Norms and declared values	Creation of style and character of company functioning with high quality, implementation of ethics statue books
Marketing	Targeted on continuously adaptation products to the needs of customer, selling of benefits packet, not only products, partnership with customer	Activity including advertisements, planning of product, selling	Orientation on marketing process, in which Take part All employees of company , and also customers
Information	Transformation of data and information in knowledge and wisdom of human	Lack skills of gaining valuable data – overflow of information	Reduction of overflow information, honest analyze of information property their interpretation, implementation of knowledge management
Communication	Horizontal communication	Vertical communication	Horizontal communication
Role of superior, owner of company	Creation adequate atmosphere in company, favoring development of employees, direct contacts with subordinates, permanent observation of environment	Tense atmosphere, Lack listening ideas of subordinates – one right Decision of manager, Lack delegation of powers	Implementation friendly climate, improving conditions of work, listening subordinates, creation climate favoring sparing knowledge, openness on environment, use of external services

The conversion small and medium companies in intelligent companies requires from manager using few important rules [12]:

- Realization, that are gaps in knowledge and the same need of using from achievements of other,
- Using changes from macro economical area (continuously following changes in environment, transfer of technology, using from alternative solutions in a scope of financial sources, using from external experts knowledge),
- Wide understandable openness on environment (maintenance good relations with customers, suppliers, competitors can decide about success of company),
- Going-away from old methods and organizational structures, investing in human capital, implementation of new ideas connected with personal development of employees, planning their carriers.

4. 2. Role of management board in a process of knowledge management implementation

Knowledge management should serve to achieve goals strategically for company, that's why the basement of efficient knowledge management implementation is assurance, that the management of company gives one common direction for all initiatives. It is important that the thinking in strategically categories dominate in a process of knowledge management implementation. The condition of success the implementation system knowledge management is getting support of management, and in the best case managing program by the manager of the highest level. Leadership performing by the member of management permits on [31]:

- Integration and coordination activities consisting of the knowledge management in a company,
- Providing means (access to the infrastructure, time and other) essential for performing actions,
- Supporting change of organizational culture through giving for subordinates example.

It is extremely important, that all initiatives connected with knowledge management don't meet since beginning with resistance of company workers. Success of this kind of management in a large degree depends on values having by the company employees, on the way to manage it. That's why very big role play the organizational culture, consciousness, that it will be no barrier for knowledge management implementation. Audit of organizational culture and elaboration of it target model permits on analyzing gap between current cultures and wanted.

Consciousness existing in this gap is necessary for projecting activities having for the purpose its elimination.

It can happen that the change of organizational culture on culture of sharing knowledge will be possible based on existing basic values, cultural assumption, changing only artifacts, so the ways of behavior, symbols, language. The pattern for managers can be Saitec Koło company, in which has been done researches of culture, have elaborated target model of organizational culture and to it is adapted system of trainings, motivation system, management system, payment system.

Results of researches done by Thomas Davenport together with consultants Ernst & Young in American companies confirm that even the technology is a necessary element, so however about success of projects connected with knowledge management in bigger degree decide organizational culture. That's why change of organizational culture on culture of cooperation and sharing knowledge is a basic condition of effective knowledge management implementation. If employees will willingly share knowledge, search it and use at work, will also use the tools enabling theme such a activities [31].

4. 3. Formation of organizational culture favoring sharing with knowledge

Each company has its own separate way or also philosophy of acting. Reflection of it can be found in attitudes and behaviors of employees, their way of acting, opinion on company and done work, way of problems solving, language of interior design etc. Phenomenon has a name of organizational culture [20].

Organizational culture enables integration around objectives of organization [18]:

- Offer common language,
- Describe and define borders between groups of employees,
- Define rules of exercise authority,
- Help in meeting the needs of safety and affiliation,
- Include written and unwritten rules of rewarding and punishment,
- Offer challenges,
- Offer believes ideologies.

To the features of organizational culture in company can be included following elements [31]:

- Cooperation – the most important aspect connected with knowledge management is necessity of sharing with it and it concerns all employees of organization. In a company, in which there is a perception, that everything is an effect of work in a group, exist climate favoring creation of organizational culture, important for improving organizational activities.

- Smooth functioning of company require elimination element of competition between employees, because it exclude sensation of solidarity and mutual engagement in a common reaching of group objectives and organization [23].
- Learning from mistakes – for sparing with knowledge building consciousness of human value is very important in a company, providing feeling of security after sharing knowledge – both knowledge connected with success and with defeats. “ to encourage people to sharing with knowledge about, what went wrong, mostly they shouldn’t have tear off the heads for that” (Hewlett – Packard Consulting) – employees have to be conscious of this, that sharing with failure will not born for theme negative consequences [31]. On the other hand something, should be created in the same time by theme attitudes concentrated on finding reason of mistake, realize, why something went wrong. Such an approach of employees let theme in deed learn from mistakes, so not to repeat two times the same mistakes. Extremely important in the same time is that the example flow “from up”, that not only employees from the lower level share with failures and their mistakes.
- Continuously learning. One of the value in Nokia is *continuous learning*, so continuously improving own skills. During recruitment is emphasis to say with possible big certainty, that future potential employees have open brains, want to improve and have adequate attitude to gain knowledge. The same concern planning of succession, so finding successors on key positions in a company. Here are also values taken in consideration. Evaluation is not only this, what was reaches, but also in which way.

“Level of culture doesn’t set standards and values declared only by norms and observed values. Gaining, using and sharing with knowledge should become element of culture” [12]. Creation of adequate organizational culture especially in small and average companies can decide about success implementation concept of knowledge management.

From all changes in a process of management the most difficult is a change of culture. The most oft stumble mistakes by the change of culture are:

- Manipulation in sphere of values and mentality,
- Bringing strange cultural patterns, while culture of company gain thanks own specification,
- Delivering universal schemas of changes, what can mean annihilation ghost of company and it uniqueness.

Essence of culture conversion is first of all change of value system and believes of employees, which will result in change of behavior and attitudes.

4. 4. Initiative of knowledge management implementation

Implementation of knowledge management means necessity of leading activities in a three key dimensions: 1) in dimension of integration processes knowledge management with business processes, 2) in cultural dimension, 3) in technological dimension. The world experiences shows, that the success of knowledge management depends on adequate connection activities in a three areas. Not incorporate one of theme can mean failure of initiative of knowledge management. Inter alia that's why it is, that knowledge management is simultaneously so easy and so complicated.

In a table 4.2 are given example behaviors desirable and these, which has to avoid in a different areas of company activities.

Table 4.2. Bad and good practice in knowldge managemnt (K-E. Sveiby: *Od Co robić do Jak to robić*. Personel i zarządzanie, Nr 8, 2005)

	<u>Scope</u>	<u>Wrong activity</u>	<u>Good activity</u>
1	Internal climate	Competition	Cooperation
2	Organization	Closed, vertical	Open, flat
3	Systems	Not integrated	Integrated
4	Customers	Not engaged in a process of knowledge sharing	Engaged in a process of knowledge sharing
5	Gaining information	Not understandable	Understandable
6	Strategy of company	Unknown	Known and popularized in all company
7	Managers	Gap of appropriate people to menage knowledge	Presence of people caring about knowledge management
8	Information policy	Everything is undercover	Everything is clear and transparent
9	Rewarding and motivation	Reward and motivate employees , who don't share with knowledge.	Reward and motivate employees, who develop own knowledge, and after that share with the other
10	Structure of knowldge management	Closed – create closed groups of managers steering flow of information	Open, transparent, in which are included intellectual employees, internal clients and external of company

Implementation of knowledge management in a small and medium companies is not a well known and described issue. It can be however describe referring to the experiences of big companies. The most important task in knowledge management implementation is gaining support between employees and leadership. Leadership of company can convince or show benefits (increase of profits), or introduction wastes, which bear currently company (costs). Such type of arguments doesn't work however on employees. People decide on paid work in organizations between other to not have to think everyday about costs, profits and risk of having business.

It shouldn't be used for the same argumentation face to face with all employees. Serial employee expects, that his work gives him satisfaction, and that the relations with superiors, colleagues from work will be at least correct, and salary tolerable. Also these earthy ambitious can fulfill system of knowledge management. But this system has to be designed and correctly implemented.

In the first step has to be assessing situation of company. Does the improvement of competences have to concern all levels of management? Each next step is adaptation existing structures to knowledge management. It's not the point of whole company activity change, but more about transferring these structures and methods, which dispose and adaptation theme to the new needs [33]. Before adaptation structures it would be worth to prepare a mark of weak and strong sides of company in the referencing to all processes of knowledge management. On this basement plans of improvement following processes of knowledge management are done.

Process of implementation knowledge management is not an easy task especially in companies from sector SMC. The company Infovide SA is being convinced about that. It is a company dealing with consulting activity in faculty of modern informatical technologies. Works on project started in 2002 year. For all activities concerning project was responsible leader of project – director to tasks of knowledge development.

Method of questioners and interviews has been done by analyzing of needs and expectations of company employees. Questions were concerning current and also desirable state of knowledge, propose areas of knowledge, suggestions on the topic of sharing knowledge methods and tools necessary to manage it. In questionnaires there have been also questions concerning this, what motivating and encouraging the employees to sharing knowledge and what do they have symptoms connected with system implementation.

On the basement of results from analysis business plan has elaborated. Costs of implementation has included in it both, so the price of software, integration with existing systems, cost of analytical works, programmed and implemented, cost of licenses and maintenance of system and also benefits from implementation. In a business plan has been indicate also main factors of risk (presented in table 4.3), and also methods, which try to decrease or bulldoze theme.

Table 4.3. Knowledge management – types of risk and remedial methods in a company Infovide SA
(H. Gurny: *Trzydzieści procent oszczędności*. *Personel i Zarządzanie*, Nr 8, 2005 s. 45)

Group of risk	Types of risk	Remedial method
Strategical	Implementation of knowledge management system will be not treated by employees as priority (on the first plan will be Project of client)	Motivation system of employees
	Will be also visible financial limitations	Convincement of management about weight of knowledge management project
Organisational – cultural	Role of knowledge management in a company will be not property understood by employees	Information action, promoting idea of knowledge management
	„Creators” of knowledge resources will not have adequate strong motivation, to collect and transfer knowledge to other (because of Lack of time, benefits, concerns of loosing position)	Motivation system of employees
	Future users of system will not have neither time nor willingness on using from gathered knowledge	Conviction of users to the system thanks showing benefits f.e. from uniform and easy accessible knowledge base
	Motivation of employees is set on reaching short wave effects	Motivation system connected with strategy of company and long wave aims
Technological	Occurence of opinion, that „we will build system, which will be useful”.	Creation of clear structure of system, easy to use, with readable and fast available knowledge base f.e. about current experiences – good and bad in realization projects.
	Employees will look after that the system of knowledge management work too slowly (especially outside the office) and will not search needful information, additional include nothing worth and not verified knowledge (is informational mortal)	Building fast working system and care about clear structure of gathers there knowledge

Processed	Fail time for activities connected with knowledge management during realization of project for customer and after project	Adequate organization of time work during project realization and after it finish, supported by information activities and motivational
	Knowledge will be not current verified	Current actualization and verification of knowledge gathered in a system
	Too much time takes verification of substantive quality of resources and their actualization	Leading information action among employees, Prowadzenie akcji informacyjnej wśród pracowników, wyznaczenie osób odpowiedzialnych za gromadzenie najświeższych informacji i wprowadzanie ich do bazy wiedzy

Implementation team has consisted mainly of consultants (mostly all leaders of groups responsible for development of competences), and also directors of fillies in which are realized Project and chef of public relation department, and employees of technical department engagement in implementation information system. The task of management was designation of objectives and their stable verification [22].

Works on knowledge management implementation system have started in November 2002 year. In a time of few moths has gathered data about projects, information about teams and documents made in the most important projects realized from 2001 to the half 2003 year. Implemented system has become more and more main source of information about competences and skills of following employees and included unnecessary documentation about realized by the company projects. Although using many informatics tools, creation s.c. indexes of knowledge, enabling searching data according concrete faculty and category of information, main objective, which was improvement of effectiveness projects was not reached. It came in that was missing adequate motivational system and that the barrier is not in technology but in organizational culture [22].

That's why in a year 2004 second important stage of project has started, is till today. The main tasks on this stage are:

- Effective connection using of knowledge with operational processes of company,
- Elaborate motivational tools for people responsible for development following areas of company.

Mark of particular stages have taken up s.c. members of steering committee (boss of company and directors of following departments), but appraisal of quality and

usefulness of the informatics system have done future users – it was not important if they liked IT system but if they want to use from it. After implementation of system have compared amount of projects described in knowledge base with general amount of realized projects. Here the result was satisfactory. The degree of using gathered knowledge in a new projects has also been checked. It has been proved, that the employees mostly have used from this part of base, which had information about competences and experiences of people (s.c. localization of experts).

That's why this part of knowledge was later expanded, so that it transform in basic source of information about experiences and competences of company employees [22].

To check if fit was reached main objective of implementation knowledge management system has used following measures:

- Income on one employee,
- Margin on one employee,
- Value of s.c. person day in project,
- Profit from s.c. person day in project,
- Productivity of consultants.

This is exactly on basement of these factors, has decided about concentration attention on motivation employees. Motivation system has been elaborated so that bosses of groups and their leaders are elaborated and rewarded for effectiveness of projects and effective using of team. Experiences of company Infovide showed, that implementation of knowledge management system require time, but not only. It is necessary also effort put in shaping consciousness and adequate attitudes of employees and also creation adequate mechanisms of motivations.

4. 5. Benefits as result of knowledge management implementation

Before answering to question which benefits carry with its knowledge management it's Worth to answer how big is the scale of this occurrence in a world. Researches KPMG indicate 81% interesting of knowledge management in United States and countries of West Europe. It refers to the companies, which implemented, are during or intend to implement system of knowledge management.

The most important benefits of knowledge management in a company [18]:

1. Flattening of experience curve

Even the most intelligent, flexible and educated employees need time to know with new processes, technologies and products, which occur cyclical in a company. Good system of knowledge management favor to flattening this curve, so to shorting cycle of reduced first efficiency through creation friendly context to the changes, access to knowledge base of the best practices, information concerning company histories etc.

2. Increase of productivity

This, what still is missing in many companies in Poland, is esteem for time. Meanwhile in many branches time of realization is more important factor than quality. To root this approach in a polish companies, has to be calculated employees not only from tasks and generated rotations, but also from time.

3. Protection of tacit knowledge

Codification of knowledge included in employees brains increase stability of company functioning, when experienced employees design from work, are transferred on other positions or when leave retired.

4. Better support for decision process

Wise manager before makes decision, should find out, which occurrences existed currently are unique, and which are recurring. Good system of knowledge management should show context of current decision.

5. Limitations of company losses

Many companies suffer losses because of repeat mistakes and unnecessary repeat the same activities by employees. The properly system of knowledge management establish limitation of these occurrences through learning from mistakes.

Researches done by KPMG (fig.4.8) showed that companies thinking about implementation knowledge management have most of all consideration of improvement of competitive position (79%), improvement of marketing activities (75%), better cooperation with clients (73%), growth of innovations (64%), growth of profits and incomes (63%) and development of employees (57%).

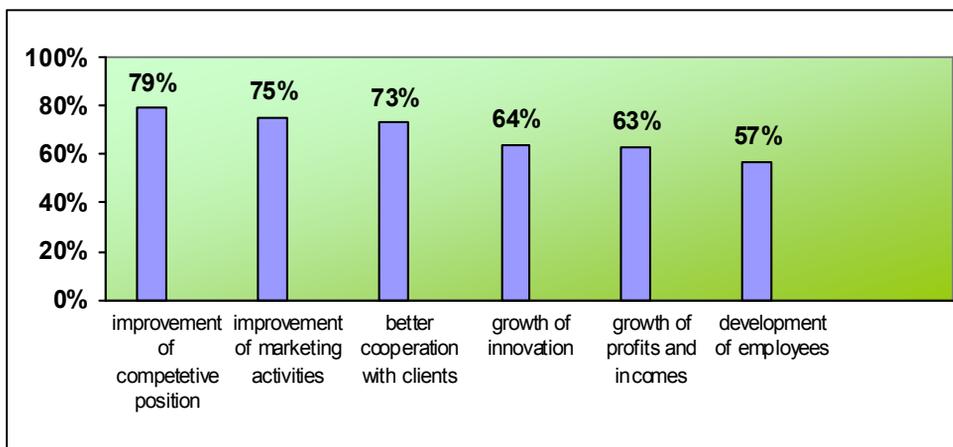


Fig. 4.8. Benefits of implementation knowledge management (A Błaszczuk: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004, s. 38)

Making the same questionnaire in Poland (fig. 4.9.) showed that for respondents the most important is better satisfy needs of clients.

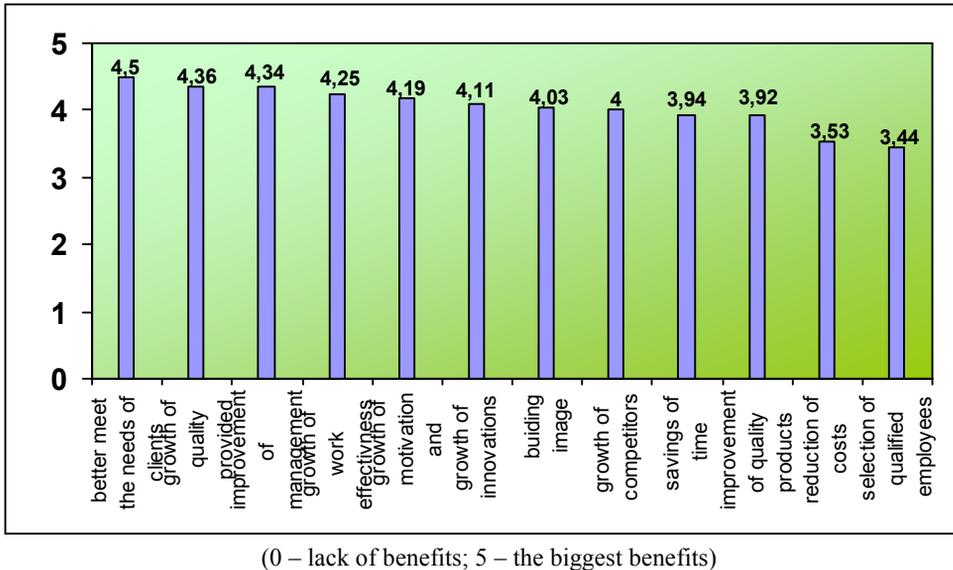
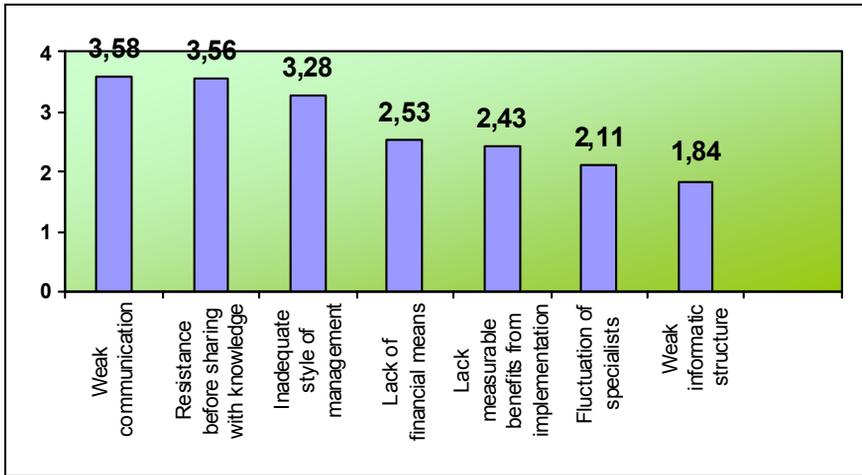


Fig. 4.9. Expected benefits by companies after implementation knowledge management (A. Błaszczuk: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004, s. 94)

It proved that in Polish economy it's not a problem to produce only to sell. It connects also with occurrence increase of quality as a second expected improvement. Probably it result also from trend in management which occurred in the last years, and which quality recognize as "overriding aspiration of each company" [13].

4. 6. Barriers of knowledge management

It is important to indicate barriers and resistances before implementing concept of knowledge management. From researches done by the team from School of Economics in Warsaw [13] result, which mainly difficulties rely on necessity of making changes not only in technological sphere, but also in organizational culture. On the fig. 4.10 has presented the most often of the indicated barriers. As far as, in case of need the change of technological solutions the barrier can turn out outlays, but changes concerning organizational culture defined as the most difficult to overcome, because they concern every employee separately.



0 – lack of barriers; 5 – very big barriers

Fig. 4.10. Barriers in knowledge management (A. Błaszczuk: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. 2004, s. 95)

Other researches done on groups of 128 people from 32 average companies[18] permit to see, that employees put on the first plan to meet the needs of psychic: needs of recognition, prestige, acceptance, and membership to the group. In a small degree identify individual needs with needs of group. Necessity of sharing knowledge arouse in many of them negative emotions, which source is competence between particular employees clearly dominate over cooperation. In researched companies in most of cases has indicated, that the superiors don't build culture of organization favoring exchange of knowledge, don't take into consideration process of appraisal employees and lack of motivation system.

Researches done by polish filial Bernard Brunhes International showed, that although multiplicity of techniques and systems of knowledge management till 75% asked managers think, that the process of knowledge management in their company is bad organized. Very often in polish companies are not used to the activities in a scope of knowledge management to realize strategy of company. Is a gap of consciousness, that knowledge management is not aimed in itself, but the mean enabling on realization other aims? Research Bernard Brunhes showed, that having big range of knowledge management techniques is not sufficient, that the employees would like to share it with benefit for a company. Most of all are necessary favoring that organizational culture. One of the main barriers in effective implementation of knowledge management in a company is a lack of motivational elements (fig. 4.11).

Because employees are not rewarded for efforts sacrifice for transfer of knowledge they treat it as second plan. Another very often meet barrier is lack of convincement and engagement of superiors. Employees, seeing that their superiors don't put attention to the tools of knowledge management e.g. don't introduce data to the informatics system, don't do this for their own [38].

Problem concerning especially small and average companies is lack of means enabling implementation and later verification of correctness working system of knowledge management.

There are many barriers concerning knowledge management. Hence often question „was it worth?“. Results of researches Bernard Brunhes in Poland shows, that companies which were successful implementing system of knowledge management see benefits flowing from that. Are conscious, that development owe by gaining new competences and stimulating creativity of employees.

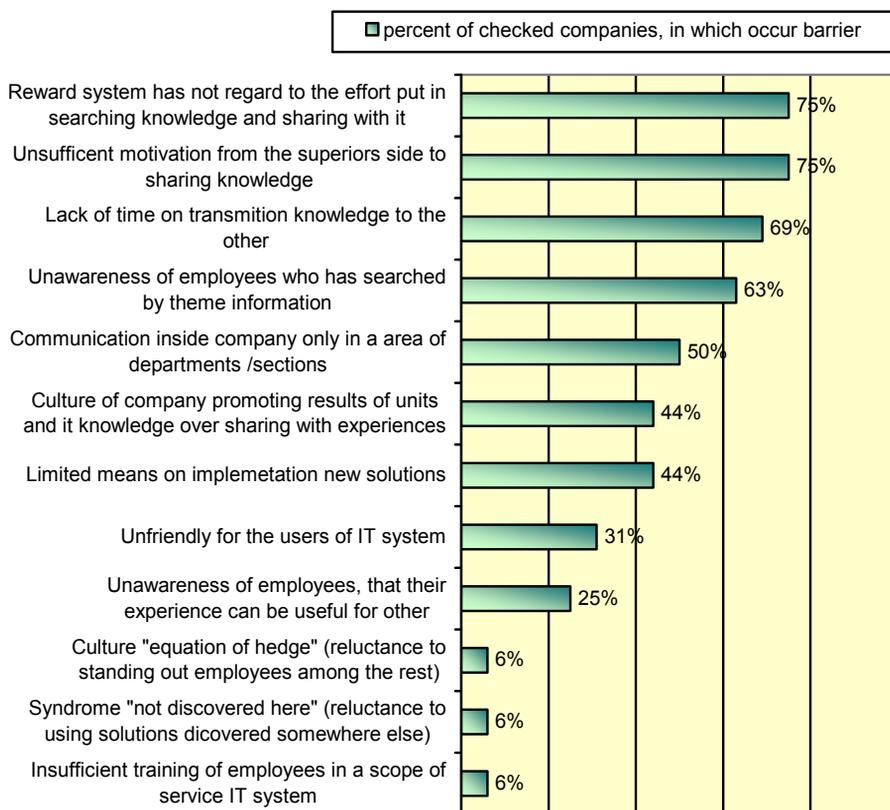


Fig. 4.11. Barriers of knowledge management (Bernard Brunhes: *Dlaczego polskie firmy źle zarządzają wiedzą*. Harvard Business Review Polska, Nr 4, 2005, s.19)

Conclusions

Knowledge management is based on the assumption, that the knowledge is the most valuable resource of organizations in the whole world. However, new methods better use are still searched for, in order to manage this “capital” more effectively. Appropriate knowledge management improves cooperation between employees, decreases decision uncertainty, limits doubling work bring done already and encourages employees to mutual exchange of knowledge - in result that savings of time and money for employees and organizations. Customers in turn – and especially strategically clients – receive solutions resulting from using the knowledge of a whole organization, and not only cooperating team. Knowledge management relies on capturing the experience of the organization so that it is readily available for each employee, according to their hobbies, needs and rights. In a dynamically developing companies, with constantly growing resources and knowledge, which are more difficult to handle, knowledge management gains a deciding meaning.

Systems of knowledge management permit to use the bigger potential of experience during resolving problems, which the organization faces each day.

In the sector of small and medium companies the concept of knowledge management is not as universals in big companies. It is mainly recognized in term of modern informatic solutions. The main problem are the costs connected with the implementation (costs of new work places, new software licenses and maintenance etc). Also cultural barriers become important. Missing also is the awareness, that in a correctly operated system the whole company has to be engaged – from the several managers to individual employees of the company. However more and more people recognize that a proper implementation of a system of knowledge management brings big benefits and allows for stable building of the competitive advantage. Implementation of The system is not easy and usually takes a longer period of time. An adequate approach to this concept and a longer perspective will surely guarantee a success.

Bibliography

- [1] Jashapara A.: *Zarządzanie wiedzą. Zintegrowane podejście*. PWE, W-wa, 2006.
- [2] Kowalczyk A., Nogalski B.: *Zarządzanie wiedzą. Koncepcja i narzędzia*. Wyd. Difin, 2007.
- [3] Mertins K., Heisig P., Vorbeck J.: *Knowledge Management*. Springer Verlag, 2003.
- [4] Byrne D.: *Essential Knowledge Management for Those Working with Information*. Web of Knowledge (Book). Facet Publishing, 2009.
- [5] Maier R.: *Knowledge Management Systems*. Springer Verlag, 2002.
- [6] Rollett H.: *Knowledge Management*. Springer Verlag, 2007.
- [7] Hislop D.: *Knowledge Management in Organizations*. Oxford University Press, 2009.
- [8] Sabrautzi S.: *Knowledge as a key resource for companies - requirements for successful knowledge management*. FOM Berlin, 2010.
- [9] Jemielniak D., Koźmiński A. K.: *Zarządzanie wiedzą*. Wyd. WAiP, 2008.
- [10] Karagiannis D., Zhi J.: *Knowledge Science, Engineering and Management*. KSEM Vienna, Springer Verlag, 2009.
- [11] Kisielnicki J.: *Zarządzanie wiedzą w systemach informacyjnych*. Wyd. AE Wrocław, 2004.
- [12] Białoń L., Zagórska M.: *Przekształcanie MŚP w przedsiębiorstwa inteligentne*. *Ekonomika i Organizacja Przedsiębiorstw*, Nr 4, 2005.
- [13] Kłak M.: *Zarządzanie wiedzą we współczesnym przedsiębiorstwie*. Wyd. WSEiP, Kielce, 2010.
- [14] Chyba Z.: *Wiedza a konkurencyjność małych firm high-tech*. *Ekonomika i Organizacja Przedsiębiorstw*, Nr 9, 2005.
- [15] Dąbkowski A.: *Uwarunkowania rozwoju MŚP w Polsce*. *Ekonomika i Organizacja Przedsiębiorstw*, Nr 11, 2003.
- [16] Dąbrowski J., I. Kołodziejczyk I.: *Inicjatywy zarządzania wiedzą w przedsiębiorstwach działających w Polsce*. *Organizacja i Kierowanie*, Nr 2, 2002.
- [17] Fazłagić A.: *Kwestionariusz wiedzy*. *Personel i zarządzanie*, Nr 12, 2004.
- [18] Fazłagić A.: „*Miękkie korzyści*” z zarządzania wiedzą. (<http://cio.cxo.pl>).
- [19] Felisiak U., Kołodziejczyk-Olczak I.: *Praktyka zarządzania wiedzą w polskich przedsiębiorstwach*. *Ekonomika i Organizacja Przedsiębiorstw*, Nr 7, 2005.
- [20] Głuszek E.: *Zarządzanie zasobami niematerialnymi przedsiębiorstwa*. Wyd. AE we Wrocławiu, 2004.
- [21] Grudzewski W. M., Hejduk I. K.: *Zarządzanie wiedzą w przedsiębiorstwach*. Difin, Warszawa, 2004.
- [22] Guryń H.: *Od CO robić do JAK to robić*. *Personel i zarządzanie*, Nr 8, 2005.
- [23] Józwiak A.: *Zarządzanie wiedzą jako sposób ciągłego podnoszenia kompetencji pracowników*. (http://www.fundacja.edu.pl/organizacja/_referaty/5.pdf).
- [24] Juchnowicz M.: *Wiedzieć i motywować*. *Personel i Zarządzanie*, Nr 12, 2002.

- [25] Kaczmarek T.: *Mierzenie efektywności zarządzania wiedzą*. (www.centrumwiedzy.edu.pl).
- [26] Karwowski W.: *Zarządzanie wiedzą*. (www.ciop.pl).
- [27] Krasowski M.: *Bariery transferu technologii z krajowych jednostek naukowych do małych i średnich przedsiębiorstw*. Organizacja i Kierowanie, Nr 2, 2003.
- [28] Krok E.: *Wiedza w firmie*. Personel i Zarządzanie, Nr 1, 2006.
- [29] Moczyłowska J.: *Psychologiczne paradoksy zarządzania wiedzą*. Ekonomika i Organizacja Przedsiębiorstw. Nr 10, 2005.
- [30] Perechuda K.: *Zarządzanie wiedzą w przedsiębiorstwie*. PWN, Warszawa, 2005.
- [31] Płoszajski P. i inni: *Zarządzanie wiedzą w Polsce – Bilans doświadczeń*. (<http://www.knowledgeboard.com/download/1465/Raport-Zarz-dzanie-Wiedz-Bilans-do-wiadcze-.pdf>).
- [32] Polak, A.: *Zarządzanie wiedzą w praktyce*. Ekonomika i Organizacja Przedsiębiorstw, Nr 12, 2003.
- [33] Probst G., Raub S., Romhardt K.: *Zarządzanie wiedzą w organizacji*. Oficyna Ekonomiczna, Kraków, 2002.
- [34] *Raport o stanie gospodarki w roku 2000*. Opracowanie: Ministerstwo Gospodarki, Departament Analiz i Prognoz. (<http://www.mg.gov.pl/struktur/DAiP/>).
- [35] Sobczak A.: *Narzędzia informatyczne wspierające zarządzanie wiedzą w instytucjach sektora publicznego*. (www.egov.pl).
- [36] Staniewski M.: *Zarządzanie wiedzą: od koncepcji do praktyki działania*. Organizacja i Kierowanie, Nr 3, 2002.
- [37] Stoińska K.: *Zarządzanie wiedzą. Wyzwania dla zarządzania zasobami ludzkimi*. Organizacja i Kierowanie, Nr 1, 2004.
- [38] Touiller J., Tomczak P.: *Dlaczego polskie firmy źle zarządzają wiedzą*. Harvard Business Review Polska, Nr 4, 2005.
- [39] Walczak M.: *O wynikach niektórych badań nad zarządzaniem wiedzą w przedsiębiorstwach*. Organizacja i Kierowanie, Nr 2, 2001.
- [40] Rupert R. D.: *Cognitive Systems and the Extended Mind*. Oxford University Press, 2007.
- [41] Evans C.: *Zarządzanie wiedzą*. PWE, 2005.
- [42] Nonaka I.: *The Knowledge Creating Company—How Japaness Companies Create the Dynamics of Innovation*. Oxford University Press, 2005.
- [43] Panasiewicz L.: *Źródła wiedzy i informacji*. Ekonomika i Organizacja Przedsiębiorstw, Nr 9, 2005.
- [44] Miłkowska B.: *Dokumenty, bazy, ludzie*. Personel i Zarządzanie. Nr 8, 2005.
- [45] Serban A. M., Luan J.: *Overview of knowledge management*. New Directions for Institutional Research, 2002.
- [46] Purgał-Popiela J.: *Zarządzanie wiedzą w zmieniającej się gospodarce*. Zeszyty Naukowe AE Kraków, Nr 719, 2004.
- [47] Błaszczuk A., Brdulak J., Guzik M., Pawluczuk A.: *Zarządzanie wiedzą w polskich przedsiębiorstwach*. Główna Szkoła Handlowa, Warszawa, 2004.