

# Knowledge assets in educational institution

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## Abstract:

The educational institutions have had mostly the role of creators of theoretical contributions to knowledge management (KM) since now, or they have conducted some practical applications in cooperation with practitioners, but they can now be the objects of implementation of KM. However, even here we can meet different obstacles that need to be overcome. It is always necessary to identify and create a survey of organizational knowledge assets in a preliminary phase, which is one part of a new methodology that is developed on Faculty of Informatics and Management at University of Hradec Králové. The main goal of the paper is to describe specification of university environment related to knowledge management, problems connected with the implementation of KM in this environment and depict selected approaches to identification of knowledge assets in authors' organization.

**Keywords:** knowledge management, knowledge assets, university, knowledge processes

## 1. Introduction

Intellectual capital is considered to be one of the most important strategic resources today. That is, intellectual capital plays a key role in getting competitive advantage. Knowledge Management (KM) offers a way how to exploit intellectual capital and that is also the reason why is the KM so popular. Today KM is mostly used in commercial companies. Nevertheless, the principles of KM can be used in other types of organizations too (e.g. in schools, in public administration, etc.). In this paper we are focused primarily on universities, where the knowledge management can be seen in three areas (Mikulecká 1999):

- 1) KM lectures in some study programs
- 2) KM as the management approach of the university (similar to managing any other organization)
- 3) KM used to improve the education process

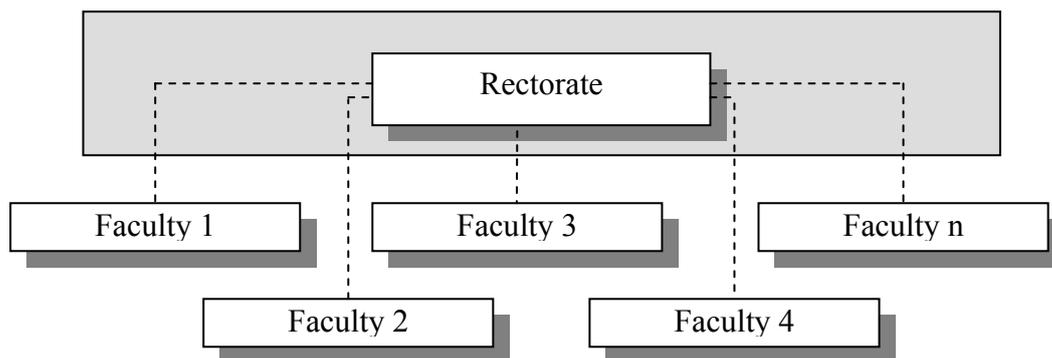
The second area will be primarily in our attention, while the first area will not be considered in this paper and third area will only be mentioned shortly. KM as the management approach of the university will be described by means of new methodology of KM introduction that is currently developed in Faculty of Informatics and Management at University of Hradec Králové (FIM UHK), Czech Republic. The aim is to critically look at the differences between educational institutions such as universities and commercial ones and tell whether use of KM is possible or suitable in educational institutions or not.

## 2. KM as the management approach of the university

The basic presumption and a little bit limitation, when we want to implement KM into university setting, is a need for a process view of the organization that is not common for university management. It is necessary to define processes on different levels (e.g. tuition, research activities, financial management, enrolment, new study programs creation, etc.) This definition should be based on the university strategy so that the processes will enable to achieve the main goals.

The universities are unique in the purpose of their main processes. The key processes at university are pure knowledge processes - knowledge creation (research) and sharing of knowledge or distribution of knowledge (teaching and training). Knowledge sharing has mostly the form of one-way teacher student communication. This is not sufficient. One of the KM efforts is to build central repository where employees/teachers put their best practices, advices, steps of actions and so on. In the repository there can be not only knowledge about domains under study (biology, psychology, etc.) but also knowledge about the process of tuition in itself or about the university processes. Through central repositories knowledge can be shared university wide and the symptom of reinventing the wheel limited. It however requires that the universities will find a way, how to persuade employees (teachers) to fill and/or update the repository. At FIM UHK for those who contribute to the repository one of the incentives has the form of money. The rules for rewarding are stated in the document called "Evaluation of basic activities on UHK". To use intellectual capital in the university more effectively management should initiate knowledge sharing throughout the whole university. The knowledge sharing effort has basically two sides. One side concerns appropriate forms of stimulations for employees and the second side covers the need to provide technological background. These aspects will be partly visible in next chapters of this paper.

Another problem that is general to Czech Republic lies in the structure of universities. In the past it was quite common to start KM implementation in one department (mostly technologically oriented) and then extend it to others. Nowadays some might rather prefer the approach based on implementing the KM centrally so that the activities can be easily coordinated. In that approach all KM initiatives are promoted and supported by the top management. Unfortunately czech universities does not allow such model. Although the organization structure is firmly given, individual faculties are fairly autonomous and the top management (rectorate) cannot directly influence them in most of the issues. This situation is depicted in the Figure 1., where the gray rectangle represents the area of the direct influence. The positions under direct influence are vice-rector, bursar, chancellors, solicitors, etc.. However faculties can be influenced only to a certain degree.



**Figure 1: structure of the majority of Czech universities**

This situation forces universities to implement KM with "bottom-up" approach. Such approach starts on a department or faculty level and tries to implement KM principles in parallel on each faculty. Problems can arise when coordinating the KM efforts and it is really difficult to do it on the university as a whole. That is because implementing KM in the whole university requires implementing it on the rectorate and all faculties separately. The issues associated are out of the range of this article.

Another type of obstacles to KM can be sought in the traditional nature of the university. In other words from decision to action there is quite a “long way”. At universities there are some mandatory procedures that need to be done before some good ideas can be realized. Concrete example can be the approval of bonuses for those who contribute to central repository. Such approval requires several instances and steps that take very long time. The same problem is with the structure of the university. Any proposed changes will be difficult to put in action because the faculties have a great deal of autonomy and can oppose the rectorate efforts to implement some new approaches. All this put considerable hurdles to KM initiatives at universities.

Even though there are some barriers in the university environment that prevent easy implementation of KM principles, the situation is not so dark. Solution to the problems mentioned above is to buy-in the management of the university and also the management of the faculty. On the bases of unity among the top managers speed up all mandatory procedures to approved proposed changes that the KM initiative requires. Next follows the buy-in of all other employees. Teachers are used to share knowledge with students but at university there are also other positions (e.g. administrative). Next, proper KM is always supported by various types of technologies. Technologies play important (but not the main role) in KM. They serve as tools that simplify knowledge processes.

### **3. Methodology of KM introduction**

New methodology briefly described later is created in FIM UHK and is still in the phase of development. This methodology takes into consideration different aspects of an organization. First of all, it is closely tied up with business strategy and business goals that must be fundamental starting point in creation of knowledge strategy. Then, it works with important characteristics of organization like organizational culture (that is perceived as one of the most problematic areas in KM introduction (Davenport 2002), (Davenport 1998) or (Tuggle 2000), knowledge and business processes and knowledge resources. Finally, it stresses that realization of KM is iterative and never-ending process that must be govern in every phase of organization lifecycle. These facts bring together many strengths of this methodology. For example by means of this methodology it is possible to explain why some KM efforts failed or set up comprehensive approach to KM. The proposal of the methodology is depicted on Figure 2.

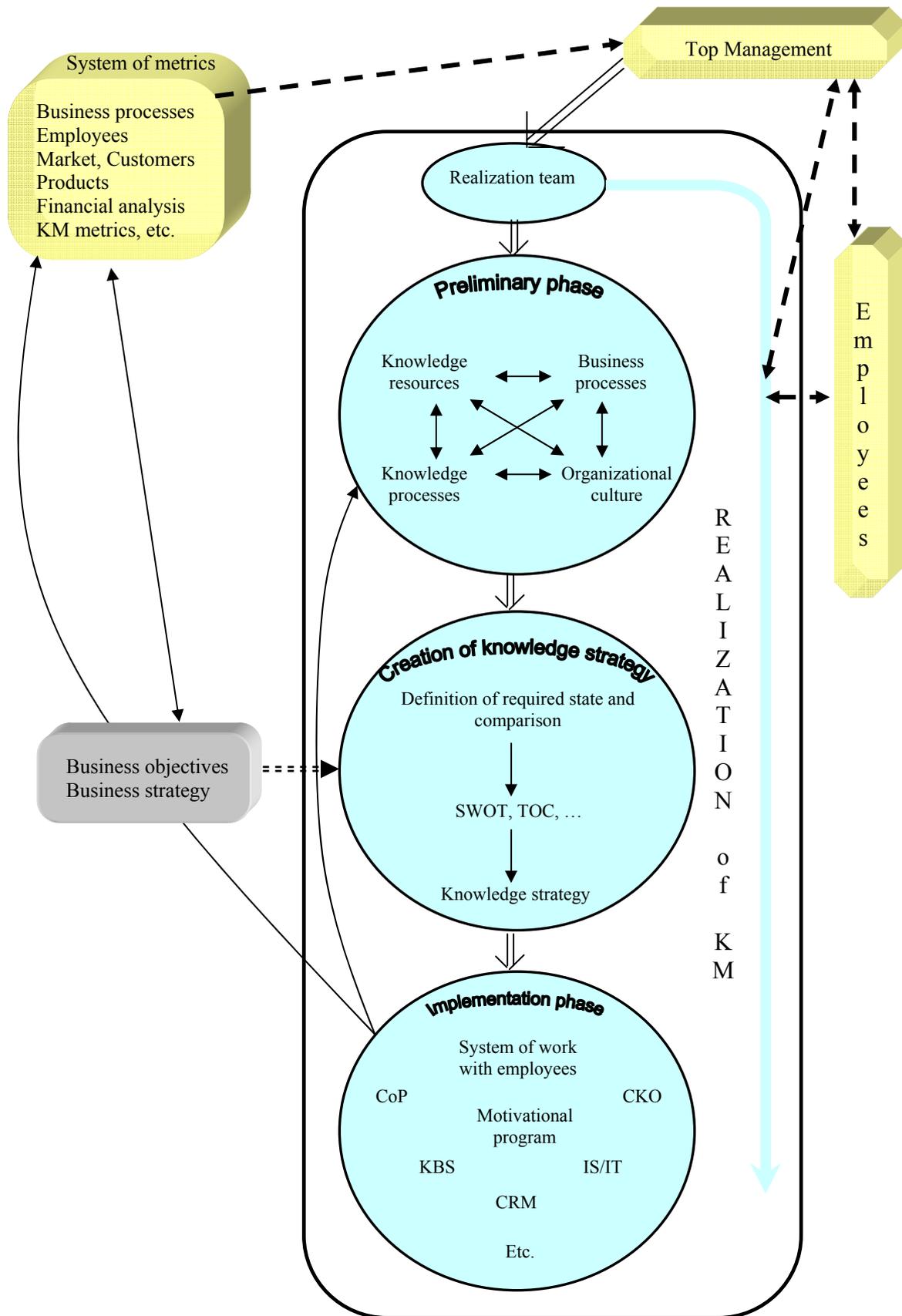


Figure 2: Schema of methodology of KM introduction

### **3.1. Realization team**

The first task that we have to accomplish is to assign people who will deal with KM introduction into the enterprise. This step can be considered as key success factor of all endeavors. That is, success of KM introduction will heavily depend on members of this team. Therefore the team members should be if not experienced then at least interested in all activities they will have to perform in the future. At the beginning the members can be from the different departments of the organization or environment. As an example members could be:

- members of the top management
- members of the personal department
- IT employees
- members of the workforce
- external consultants,
- etc.

Later, the realization team will continuously change its members depending on state of KM in the organization. Probably there will be tendencies to decrease rate of external members as well as members from top management. The main reason is that every organization should be independent on external consultants and should extend knowledge management awareness and related activities to all its parts. There is another very important issue connected with realization team. This is the appointment of Chief Knowledge Manager (CKO) that should perform specific tasks linked with KM realization. However, the exact time when the CKO should be appointed depends on the results of analysis of the initial state. This first part is obviously closely related to the issues mentioned earlier - we need to buy-in the top management of the organization. In university settings it means that we need to create a realization team with members from all part of university or faculty. It covers for example the top management, IS department and selected teachers, students and secretaries. This group participation strongly depends on experiences of team creator, however, later should be influenced by results of preliminary phase (see chapter 3.2.).

### **3.2. Preliminary phase**

This analysis focuses on four main aspects of an organization. The perspectives from which we should examine the company are:

- Knowledge processes
- Business processes
- Organizational culture
- Knowledge resources

It means not only find out the current state of these aspects, but also describe the relations among them. Since the first three items are not the main topics of this paper, the attention will be given to the last one. Curious reader can find additional information about knowledge and business processes and organizational culture in plenty of books or articles dedicated to these topics.

#### *3.2.1. Knowledge resources (knowledge assets, intellectual capital)*

This paper is focused primarily on small part of methodology dealing with knowledge resources (for our purposes we consider knowledge resources, knowledge assets and intellectual capital as synonyms, although they in some aspects do not have to be). Therefore we will provide additional information connected with this topic. Similar to the culture audit and audits of knowledge and business processes, also knowledge resources audit is realized

first of all to obtain information about the state of knowledge assets before we perform any changes related to KM. That is, our model come out from the assumption that every organization posses some knowledge resources. Nevertheless, the question is whether it realizes it and whether it exploits them. To pursue it we can use some works that already have been done in the field of knowledge resources, assets or intellectual capital. We introduce only a few of them.

For example Leonard-Barton (Leonard-Barton 1995) distinguishes two basic types of knowledge resources:

- Employee knowledge,
- Knowledge embedded in physical systems.

Petrash (Petrash 1996) in his article, in which he describes how the Dow Chemical Company created successful knowledge environment, uses three types of knowledge resources:

- Human capital,
- Customer capital,
- Organizational capital.

The concept human capital means employee's knowledge and organizational capital include:

- organizational processes,
- organizational structures,
- organizational culture.

We can find similar categorization in Horibe's work (Horibe 1999), where she describes the following three items of intellectual capital:

- Human capital,
- Structure capital,
- Customer capital.

Malhotra (Malhotra 2004) on his web pages shows a little bit more detailed survey of particular items of intellectual capital. According to his work the items are:

- market capital,
- organizational capital,
- process capital,
- renewal and development capital.

We can find similar categorization attempts also in Czech Republic. To introduce at least one work, we can name Hujňák (Hujňák 2000) from consulting company Per Partes who distinguish following components of knowledge resources:

- internal capital (its content encompasses data, information and knowledge content, business processes, rules saved in business logic, communication model of organization and organizational culture),
- external capital (is encompassed from customer network, supplier network, partner network and company's name),
- human capital (is comprised from employee's knowledge, motivation and competence).

The knowledge resources are probably in the best way worked out in the Holsapple and Johsi's work (Holsapple 2001). In their categorization of knowledge resources they came out

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from some works mentioned earlier. Preliminary phase and its part concerning with knowledge resources has basics in work of these two authors. According to them it is possible to divide organizational knowledge resources into two main groups called:

- schematic resources and
- content resources.

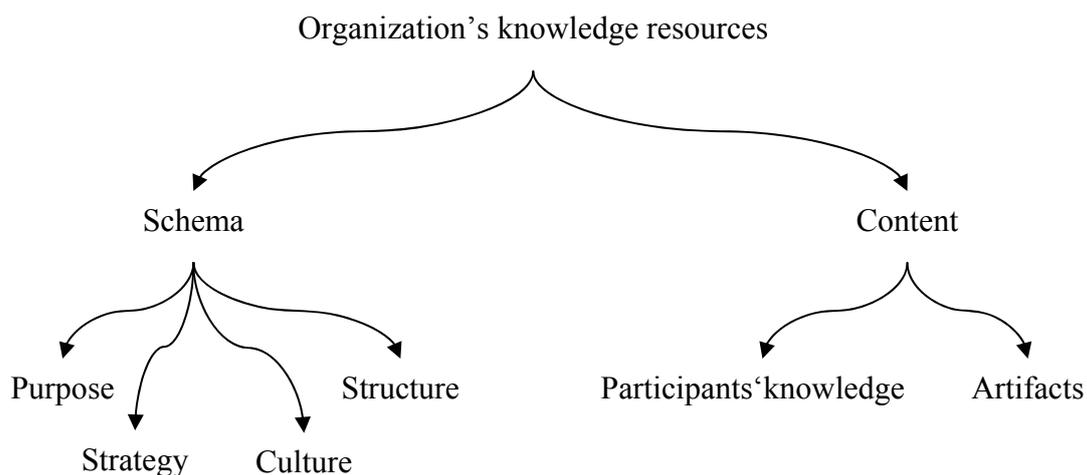
While schematic resources depend on the existence of an organization they belong to, content resources are in this sense independent. Schematic resources contain:

- Purpose,
- Strategy,
- Culture,
- Infrastructure.

Content resources are comprised of:

- Artifacts a
- Participants.

According to the authors the difference between participants and artifacts lies in the presence or absence of the ability to process knowledge. Participants have the ability to manipulate with knowledge and this ability enable them to process their own knowledge repository. Artifacts do not have such abilities (Holsapple 2001). Individual knowledge resources are depicted on Figure 3.



**Figure 3 – Structure of knowledge resources according to Holsapple and Joshi**

New methodology deals only with the right-hand branch. The reason is that schematic resources are dispersed in other parts of methodology. Purpose and strategy are related to the second phase called Creation of knowledge strategy and analysis of structure and culture is individual part in the first phase together with analysis of knowledge processes and knowledge resources. Therefore in the analysis of knowledge resources there are only content resources identified.

### 3.2.2. Knowledge resources in FIM UHK

According to significant authors among Participants we can find employees (Leonard-Barton 1995), (Stewart 1997), customers (Sveiby 1997), (Stewart 1997), suppliers, partners, consultants and computer systems (Sveiby 1997), (Wiig 1993). Participants can also be individuals, group of individuals or computer systems with abilities to manipulate with

knowledge (e.g. decision support systems - DSS, expert systems - ES, etc.). FIM UHK has following participants:

- 1) Employees – Dean’s office (dean, vice-deans, registrar), particular departments (heads of departments, professors, lecturers, teachers), Secretaries and Division of IS.
- 2) Suppliers – FIM UHK has in the first place suppliers of IS (HW, SW, etc.), therefore this category will include only this type of suppliers.
- 3) Partners – partners of FIM UHK can be divided into two categories according to country they come from:
  - a) Czech Republic – in Czech Republic FIM UHK has several partners that can be divided into three subcategories. While first subcategory encompasses individual universities in Czech Republic (University of Pardubice, Technical University in Liberec, etc.), second subcategory is comprised from business organizations and institutions (e.g. T-Mobile, a.s. Hradec Králové, Ortex, s.r.o. Hradec Králové, Unicorn Group, s.r.o. Hradec Králové, etc.). Third subcategory includes individuals predominately graduated students.
  - b) Foreign countries – In this section we will find foreign universities and organizations that are mostly partners in particular international projects (e.g. Bayerische Beamtenfachhochschule Hof, Germany, FH Technikum Joanneum GmbH, Graz, Austria, University of Hull, Great Britain, etc.).
- 4) Consultants – In this category we can find some organizations of institutions from previous sections (Partners) that play also the role of consultants who are involved in some basic processes (e.g. Dango, s.r.o. Hradec Králové, PVT, a.s. Hradec Králové, etc.)
- 5) Customers – In university settings students on bachelor and master degree and doctoral students can be in university setting considered as customers.
- 6) Computer systems – FIM UHK possess DSS or ES, but they are only utilized in educational process not for managing the faculty.

Generally, among Artifacts we can find video training tapes, books, reports, products, manuals, etc. In all these artifacts we can find knowledge, but we cannot find here the ability to process the knowledge. Knowledge in artifacts can be explicit, implicit and tacit. In this way we on FIM UHK recognize following main categories of artifacts:

- 1) Basic Documents – There are many documents we can take into consideration. However, there are some documents that are really basic and have to be stressed. Therefore we can to the basic documents include:
  - a) University act – provides general legislative framework for all activities in the university setting,
  - b) Regulations of studies and examinations – describes rights and responsibilities of teachers and students during academic year and especially during exams,
  - c) Regulations of PC network usage – sets up the rules that must be kept by all users,
  - d) The FIM Long-time plan – describes the intentions of top management to the nearest future, this plan can be considered as business strategy,

- e) The FIM Statute – this document depicts nature of FIM UHK, responsibilities, orientation, etc.,
  - f) Information about studies – this brochure introduces all details about FIM UHK (dean’s office, departments, study programs, etc.),
  - g) Dean’s Decrees – contains important decision of dean or dean’s office,
  - h) Rector’s Decrees – are similar to Dean’s Decrees, but they are released by rector,
  - i) Documents from rectorate – mostly control documents that serve for rectorate to influence faculties. Into this category we can also include all documents created on rectorate level that are necessary to keep the right course of all faculty’s activities (as an example can serve The UHK Long-time plan).
- 2) Information systems – we consider information system in the most general meaning, therefore this category include software as well as hardware. Main parts of this category are:
- a) File, WWW and Email Servers – in this server are stored knowledge from many areas,
  - b) ISIT – information system that provide many information about study programs, all students, topic for final works, exams, etc.,
  - c) WebCT – virtual study environment serving for teaching in e-learning form,
  - d) ODBPro – system comprising all details (usually in metadata form) about research activities and published book, articles, textbooks, papers, etc. by all employees.
- 3) Library – university library contains many sources of knowledge in different forms. The term library covers all items named later without dependence on their location in faculty (e.g. some books can be only in shelves of selected professors). The items are:
- a) books
  - b) journals
  - c) textbooks
  - d) CDs
- 4) Student’s works – The main part of this category is covered by Bachelor and Master thesis. Apart from these final works this category also includes seminar works, while dissertations still cannot be included into this category, because FIM UHK is too young faculty to have this type of outcome.

All significant content resources identified on FIM UHK are summarized in Table 1. It is obvious that some knowledge resource could possess the same knowledge (e.g. books in library and texts in WebCT or Dean’s Decrees are also in electronic format on web pages). Therefore, it is necessary not only to obtain the survey of knowledge resources, but also at least their brief description. We can use different attributes of knowledge resources in this description. As examples can serve type of knowledge, medium, main users, connection between participants, etc. For example virtual study environment WebCT usually includes knowledge from knowledge domains taught at faculty (psychology, mathematics, management, economics, etc.) and is utilized by dean, vice-deans, professors, lecturers and

teachers. We can seldom find there a process knowledge. More detailed description of utilizable knowledge attributes can be found in (Holsapple 2001).

Participants			Artifacts	
Employees	Dean's office		Basic Documents	University act
	Departments			Regulations of studies and examinations
	Division of IS			Regulations of the PC network usage
	Secretaries			The FIM Long-time plan
Suppliers	<i>Above all suppliers of IS</i>			The FIM Statute
Partners	Czech Republic	Universities		Information about studies
		Business Organizations		Dean's Decrees
		Individuals		Rector's Decrees
	Foreign universities and organizations			Documents from rectorate
Consultants	<i>Selected partners</i>			Information Systems
Customers	Students in all programs		ISIT	
			WebCT	
			Library	ODBPro
				Books
				Journals
				CDs
			Student's work	Textbooks
				Bachelor Thesis
				Master Thesis
				Seminar Work

**Table 1 – knowledge resources on FIM UHK**

It is obvious from this table that faculty is in knowledge management perspective very interesting organization. We dare to claim that almost every employee in faculty can be considered as knowledge resource (or asset) and faculty pursues above all if not knowledge processes then knowledge intensive processes. The main reason is that FIM UHK can concentrate itself on its own basic processes, while support processes are ensured by rectorate. Therefore the resources in every possible form cannot be “wasted” on administration

### 3.3. Creation of knowledge strategy

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On the basis of information obtained from preliminary phase we can assess strengths and weaknesses and opportunities and threats of current state of organization in KM perspective. This SWOT analysis will consecutively help us with defining of knowledge strategy. This specific type of strategy will determine our further direction of our endeavours in KM implementation. Results of previous phase can also help us overcome some obstacles connected with insufficient experience in definition of knowledge strategy and KM generally. Davenport (Davenport 1999) argues that we have to be on a certain level of maturity in KM to be able to create well-defined knowledge strategy. According to Davenport only few companies reached this level of maturity.

And how can organization realize correct decisions concerning knowledge strategy? The answer gives us on one hand previous phase and on the other hand business strategy. Every organization or its part (department, division, etc.) should select from all KM activities on the basis of how they support or facilitate business strategy and goals. Therefore the knowledge strategy should align with other partial strategies (information strategy, communication strategy, etc.) that are also determined with business strategy and take into consideration other partial strategies. This situation is depicted on Figure 4. These statements have general applicability. It means that we should follow them also in the university setting.

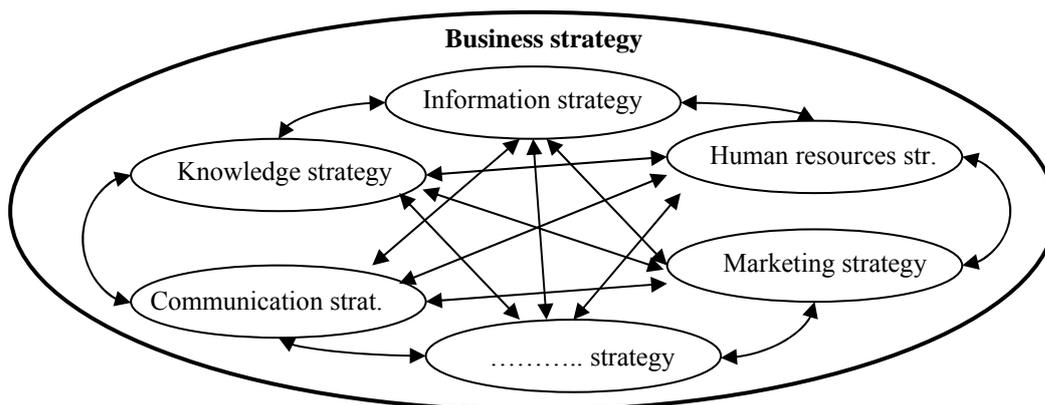


Figure 4 – Relation of knowledge strategy to other strategies

### 3.4. Implementation phase

In the implementation phase we deal with concrete steps that fulfill knowledge strategy and lead to the comprehensive KM in organization. Among these steps we can recognize for example establishment of communities of practice, purchasing and implementation of knowledge-based systems, adjustment of motivational program, business process improvement or appointment of Chief Knowledge Officer (or similar post). It is obvious that some steps can be already done, some will need only subtle or larger adjustments and some of them will be necessary to realize from beginning. Important is that the organization should realize first of all what it wants to do and why, then find out the current situation of these steps in organization and only then accomplish its intention.

### 4. Conclusion

Principles of KM are used in many organizations that are usually the business one. However, these principles are also applicable in other settings. We focused in this paper on

universities as specific institutions where KM can be seen above all in three areas. From these areas we concentrated our attention on KM as the management approach of Czech universities. This approach was described by means of methodology of KM introduction that is currently developed on FIM UHK. Methodology has four main phases. In the first phase we have to set up the team whose member will deal with KM introduction. Next phase is called Preliminary phase, because here we try to describe initial situation in organization to get better understanding of position from which we begin our journey to KM. One part of this phase is the identification of knowledge resources. We depicted some theoretical approaches to this field and applied chosen aspects of these approaches on the case of FIM UHK, where we identified main knowledge resources. Third phase deals with creation of knowledge strategy and the last implementation phase is about individual actions we want to and need to take. We came to conclusions that firstly, faculties are characterized with the fact that their basic "business" processes are actually knowledge processes and secondly, that almost every employee can be considered as knowledge resource. That is because most of the support processes are conducted by rectorate and therefore faculty can concentrate itself only on basic processes. We also identified some barriers to KM introduction but these obstacles can be overcome.

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