

# KNOWLEDGE INTENSITY OF ORGANIZATIONS IN KNOWLEDGE ECONOMY

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**Abstract:** Attention paid to knowledge can be seen at different levels. At the supranational and national levels, potential of single knowledge economies can be measured. To do this, we can use, for example, the Knowledge Assessment Methodology. It would also be useful to develop a similar methodology at the organizational level. The aim of this paper is to present the basics of our project, in which principles of this idea and an outline of a possible way how to sort out this problem based on the four pillars of knowledge management in organizations are currently elaborated.

## 1 INTRODUCTION

Nowadays, knowledge has a significant influence in many different areas of work and also every day life. Knowledge society (KS) and related knowledge economy (KE) are being developed by implementation of particular knowledge technologies or an introduction of knowledge management (KM) into organizations. This new dynamic global market environment is also known as a new, post-industrial or digital economy. It is obvious that KE and a knowledge-based competition are not theoretical concepts produced by authors of academic books or articles in scientific journals any more. It is possible to find essential characteristics of KE in various resources ((Lengnick-Hall, 2003) or (Houghton, 2000)). These characteristics are, for example, the reduced organization's dependence on the physical concentration of resources, the possibilities of interrelation and the creation of alliances, the integration of particular economic sectors or a more dynamic price creation. For example countries such as Korea, Malaysia, Finland or China illustrate the rapid progress that can be made over relatively short periods of time by pursuing coherent strategic approaches to building their country's capabilities to create, access, and use knowledge (WBI, 2006).

## 2 KNOWLEDGE LEVELS

KE brings not only new opportunities and challenges, but also obstacles and problems that have to be overcome. Success of a single knowledge activity is determined by its support at different knowledge levels. The basic knowledge hierarchy consists of four knowledge levels: a supranational level, a national level, an organizational level, and a management of knowledge level (see Figure 1). These basic levels differ in many aspects. It is important to notice that when increasing the distinguishing level, further levels can be identified. An example is a level of clusters. That is why the borders between individual levels are not clear in practice.

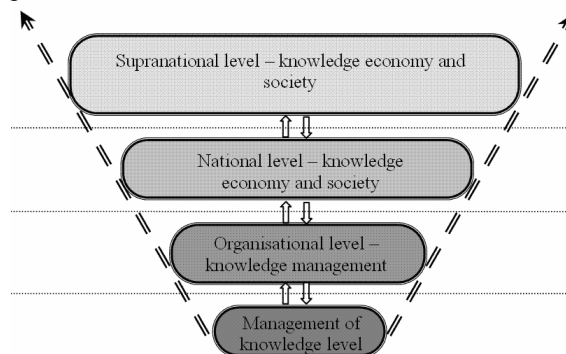


Figure 1: Levels of the knowledge hierarchy.

## 2.1 Supranational Level

The supranational level is the broadest and most general one. This level operates with concepts of KE and KS. Particular knowledge does not play any role here. This level is represented by activities of supranational institutions such as institutions of the European Union (EU) and their strategic documents, OECD with its orientation to the KE that is visible, for example, from annual reports (e.g. 2005 annual report (OECD, 2005)) and the document “The Knowledge-Based Economy” (OECD, 1996), or UNESCO, which published, at the end of the year of 2005, a document called “Towards Knowledge Societies” (UNESCO, 2005).

## 2.2 National Level

The national level is very similar to the supranational level, nevertheless, KE and KS gain the national dimension here (i.e. they are influenced by the national culture, the national business environment, the political situation, or the legislation). This level overtakes the basic principles and attitudes of the supranational level. Single national economies struggle to implement basic principles of KE into their own environment. In the case of the Czech Republic, the best way to visualise the current situation is to refer, for example, to the Strategy of the Economic Growth of the Czech Republic, the Strategy of the Human Resources Development for the Czech Republic or the Strategy of the Government of the Czech Republic in the EU Framework. This level can also be represented by particular private institutions. An example is the association of particular organizations, named the Association for Information Society and its document “Manifest of Knowledge Society” (SPIS, 2005).

At the two levels mentioned above, it is already possible to measure the overall potential of knowledge development in a given country or overall level of development of a country or region towards KE. To realize this, we can apply the Knowledge Assessment Methodology (KAM). KAM was designed by the World Bank Institute’s Knowledge for Development Program to proxy a country’s readiness to compete in KE using more than 80 structural and qualitative variables. The comparison is undertaken for a group of 128 countries, which includes most of the OECD economies and more than 90 developing countries (WBI, 2006).

The observed variables are based on the four pillars of the KE framework (Chen, 2005):

- an economic and institutional regime,
- an educated and skilled population,
- an efficient innovation system of firms, research centres, universities, consultants and other organizations,
- information and communication technology.

Several variables that track the overall performance of a given economy are also included in the KAM. These variables help to illustrate how well an economy is actually using knowledge for its overall economic and social development. Every country can be assessed and compared with others on the aggregate performance on each of the KE pillars or the overall KE Index and Knowledge Index that are derived from KAM. The KAM also makes possible customized country analysis and cross-country comparison. This allows for capturing various aspects of an ability to generate, diffuse and apply knowledge for economic development (WBI, 2006).

## 2.3 Organizational Level

The organizational level is a further level, where KM is conducted. Here, KM means a knowledge-based and knowledge-oriented management of an organization, regardless of the main objective or type of an organization. Therefore, KM can be introduced, for example, in business organizations, educational institutions or in state administration bodies. The reason for this effort is that a large number of organizations realize that traditional resources are not the only sources that should be managed during the transition to KE. It is necessary to emphasise that the organizational level has currently many problems (e.g. KM is generally perceived in different ways, which leads to obstacles in communication and cooperation). Knowledge intensity (KI) is a relatively new concept that is very important for further development of this level. Here, the KI means readiness for and performance of individual knowledge activities in particular organizations.

There is a strong conviction that the idea of KAM is transformable to one of the lower levels, namely, the organizational level. The achievement of this goal needs a multi-disciplinary and trans-disciplinary approach. Because of the wide diversity of single organizations in an economy, it is necessary to use a general system approach and to find factors and phenomena that shape the organizational KI in general. The brief description in

the above paragraphs indicates several utilisable methods and tools. The key roles should be played by contemporary managerial methods such as Balanced Scorecard, existing methodologies for creating complex systems (e.g. software systems), tools and techniques from object-orientated modelling of organizational processes, or methods and techniques for development of individual knowledge technologies (e.g. CommonKADS). Therefore, the main goal is to get new theoretical results for modelling and quantification of the organizational KI. It would be useful to design and develop a methodology that will quantify the organizational KI in a way which will also be comparable with other organizations.

Contemporary solution is based on methodology of KM implementation KM-Beat-It, which uses four main pillars for the assessment of an existing state in an organization (Bureš, 2005).

First of all, it is necessary to describe, measure and estimate the potential of organizational **knowledge resources**. These can be observed, for instance, as (Holsapple, 2001) have suggested. According to authors, it is possible to distinguish two main groups of organizational knowledge resources – schematic 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, and Infrastructure, content resources are comprised of Artefacts and Participants.

Subsequently, the organizational **knowledge processes** have to be described, modelled and analyzed. To conduct this activity, we can select from either simple models of knowledge processes (e.g. (Marquardt, 1996), where knowledge processes are – acquirement, production, transfer and exploitation of knowledge) or from a complex one (e.g. (Beckman, 1999) works with identification (determination of basic competence or specification of knowledge domains), capture (formalization of existing knowledge), selection (assessment of knowledge relevance or its value and accuracy), storage (representation of organizational memory in a knowledge repository), sharing (automatic distribution of knowledge to users according to their interest, working position, etc.), application (use of knowledge in decision making processes, problem solving, education and training, etc.), production (discovery of new knowledge by research, experiments or creative thinking), and sale (development of new products and services and their market introduction).

The third pillar is represented by **organizational processes** that exist in every type of organizations. These processes should be already described in single organizations (for example by usage of UML). If they are not described or modelled, then it is obvious that a given organization can not reach satisfying results related to the KI.

The last pillar is **organizational culture** that shapes the overall environment in individual organizations. It can either support or totally destroy all efforts related to knowledge activities. That is why it is important to determine indicators that will measure this level of its support.

Readiness of particular countries for the KE is dependent on the readiness of single organizations for KM and performance of knowledge activities. With the new methodology and its outcomes, decisions in the area of KM will be strengthened by managers' knowledge or awareness of processes, resources, departments, etc. of their organizations that have a weak performance from a KM perspective. Therefore, they will be able to make efficient and more effective decisions in organizational resource allocation, finance budgeting, etc. Hence, it is obvious that the problem of quantification of the KI is fundamental.

To be successful, it is necessary to clarify and describe relationships between KE and single knowledge activities of particular organizations (i.e. their KI). More precisely, answers for the following questions have to be found:

- What is the definition of the organizational KI and what are the possibilities of its quantification?
- What kind of relationship exists between the organizational KI and the KE?
- In which ways is the organizational KI already perceived (described, modelled)?
- Which methods, techniques and tools are utilisable for quantification of the organizational KI and how to design and implement them into a managerial environment?
- How to benchmark the KI of individual organizations in KE?
- In which way is the quantification of KI able to contribute to the support of managerial decisions of higher quality at tactic and strategic levels?

## 2.4 Management of Knowledge Level

The management of knowledge level (MoK) is the lowest level, which works with some particular knowledge. This level consists of two main parts. The first part is technologically oriented and it is

focused, for example, on data mining from databases, knowledge systems, multi-agent technologies, mark-up languages, or semantic web. The second part includes methods, techniques, procedures and principles of work with knowledge from other non-technological disciplines such as psychology or sociology. Nowadays, it is not usual to consider these methods and techniques as a part of this basic level. Nevertheless, they fall into this level, too. They also work with knowledge, but for example with different types or in different ways.

### 3 CONCLUSIONS

The attention paid to knowledge is relatively very recent, and KE is reality, which influences the life of everyone in our economic and social system. It seems meaningful to support the argument that further advancement of KE is strongly dependent on the state at the organizational level. Although, for instance, knowledge processes are performed in some organizations at a relatively sufficient level (e.g. research institutions or universities), new impulses and challenges have to be focused on other types of organizations. We shall focus our attention, when studying possibilities of further evolution of the KE, on the performance of single organizations in KM activities and on general indicators of this performance. Generality and future utilization of achieved results in any organization are the leading aspects of this effort.

The described knowledge levels create one coherent system that has its own significant relations. It is evident from the paragraphs above, that MoK and other disciplines working with any type of knowledge represent the basis of all activities connected with knowledge. Their products are applied at the organizational level. If this fundamental level does not work properly, all other activities at higher levels will not necessarily be complex and complete. Thus, the organizational level constitutes the basis of KE both at the national and supranational level. It is also apparent that the higher the level, the higher the generality. The basic level of MoK deals with real knowledge and is developing instruments and procedures, how to acquire, process, distribute or exploit this knowledge. At national and supranational levels particular knowledge does not play any role. The main goal and purpose of all these activities is the creation of an environment and its framework (economic, political, legislative, etc.), in which lower levels will successfully operate. All these facts

have to be considered during the creation and design of the new methodology that will measure and enable benchmarking of KI among individual organizations (or economic sectors).

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