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## KNOWLEDGE MANAGEMENT TOOLSET ANALYSIS FOR LEARNING ORGANIZATIONS

**Kateryna Solovyova, Andrey Danilov, Panasovska Yuliia, Kobrin Maksim**

**Abstract:** *The modern society's existence is inseparably linked with the development of information technologies. Today information plays a key role in the development of our society. As a result, science is beginning to move up to a more advanced stage of development - the noospheric one. The noospheric stage of scientific development involves the use of modern noospheric system approach and innovative methods and technologies based on knowledge. This work is based upon a noospheric system methodology (systemology) which allows to consider complex systems holistically, to take into account their essential (ontological) properties and relations, to solve the complicated ill-structured problems relying on knowledge. The application of the systemological classification analysis on the basis of the natural classification criteria allows to define and to simulate deep knowledge being adequate for any subject domain including the ill-structured ones; to consider the objects' essential properties. Using of the knowledge-oriented system tools allows employees to build intellectual capital, will allow organizations and states to develop in a more efficient, competitive way and to form knowledge economy. Knowledge management tools are the most effective means of managing organizations to improve their competitiveness.*

*Alongside the increasing number of Internet users, the enhancing of its availability, the effectiveness of social networking on the Internet in organizations rises, it is especially vital for employees training. The improvement of quality of social networks functioning on the Internet requires the adequacy of their domain, adaptability and user-oriented interface. The paper has presented some results of studies on knowledge systematization in the subject domains "Social Networking on the Internet", "Competences" on the basis of systemological classification analysis that is directly relevant for the education field, the learning organizations creation, functional platform for further development of this direction.*

**Keywords:** *knowledge management, a learning organization, a social network on the Internet, a competence, knowledge-oriented technology, the Internet, systemological classification analysis, classification, a systemology model, education, noospheric stage of scientific development.*

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### Introduction

The enhancing of information technologies' role in society is a natural process that has accelerated within the recent years. The emergence of new methods, techniques and approaches to the various subject domains' activities requires the use of modern information tools that will significantly improve the employees' efficiency.

The modern information technologies application is of significant importance to the rapidly growing industries as well as to the industries which depend on the society's functioning and development. The life protection, environment industries etc. are of great consequence. But there is a direction which is not possible without a

sustainable development of the company, organization, person, government and society as a whole; and that is knowledge-based direction, knowledge management, and learning.

To improve the education quality and training level it is necessary to meet the scientific development trends and educational methods. The use of modern teaching methods, knowledge management elements particularly will significantly improve its potency and effectiveness. The current developments in the knowledge management field corresponding to the noospheric stage of scientific development have been considered in the paper.

### The object of the research

The object of the research is to present the knowledge-based systemological approach within the "Social Networking" and "Competences" domains, aimed at improving the education quality and the organization's intellectual capital level.

### The method of the research

As a method of the research and solving the set tasks, the systemological classification analysis method, which refers to the noospheric stage of scientific development and is able to effectively solve ill-formalized problems, has been employed. The diagram presenting the systemological classification analysis principal steps has been given iteratively at Figure 1.

#### **SYSTEMIC CLASSIFICATIONAL ANALYSIS OF AN ARBITRARY OBJECT DOMAIN**

##### SCHEME OF THE PRINCIPAL STEPS:

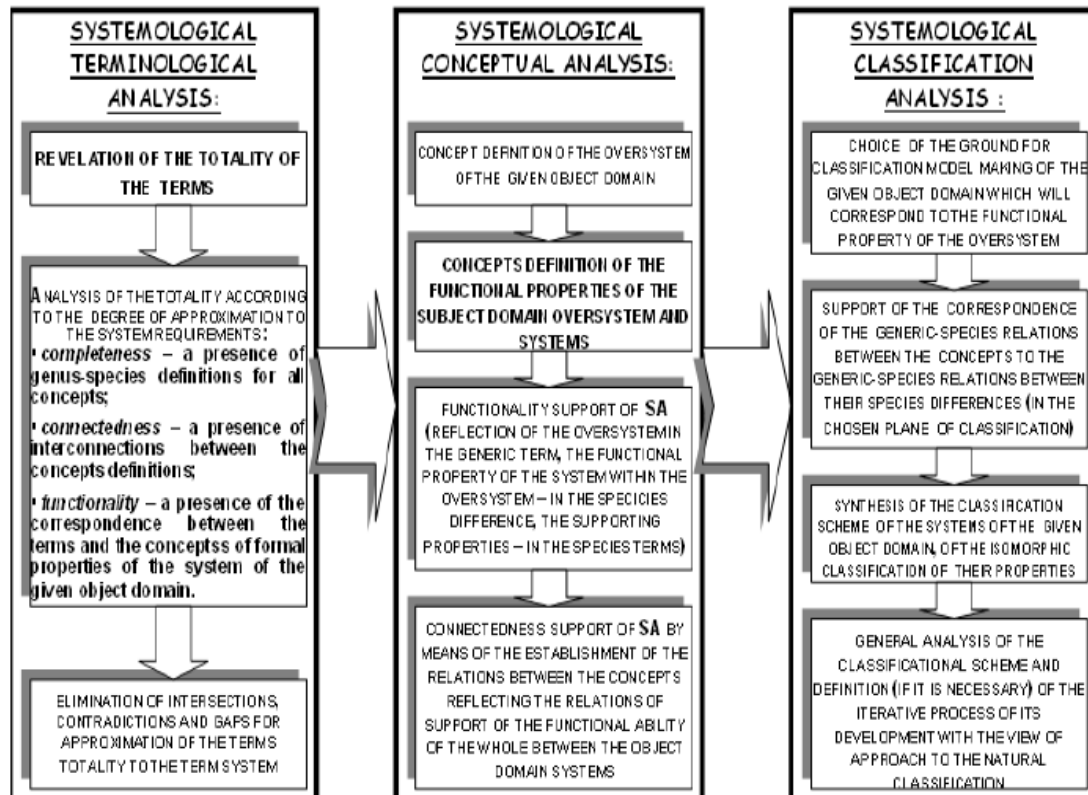


Figure 1. The scheme of the principal steps of systemological classification analyses [1]

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The systemological classification analysis method application allows us to construct and evaluate any classification (taxonomy) in terms of its validity (parametricity), domain's adequate reflection and objects' essential properties. The method also enables the objects' detection and prediction depending on their location and properties in the classification and allows using classification as a theoretical analysis tool in the relevant domain and successful implementation.

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### **The social networks development urgency in the educational sphere**

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The information technologies development leads to the necessary application of the up-to-date business practices and information professionals' training. An increasing number of different human activity sectors integrate their functions in the information sphere; nowadays it is very difficult to imagine any human activity area that does not use information technologies and does not depend on the Internet in their daily work. This is especially true of the state strategic sectors which determine the society development to the great extent. One of such industries is education through which companies and organizations can get modern highly qualified specialists [2].

Social networks provide the educational system with many potential means:

- Easy exchange of experience and knowledge between people from different cities (countries) without the personal presence that will bring both foreign students and professors from leading universities in the world to educational and scientific processes;
- Access to the network members' information. Using a university's social network will provide large amounts of information on scientific subjects which will be classified basing on the systemological classification analysis method; this will greatly reduce the seek time and increase the useful scientific work amount;
- Fast and easy way to get advice from experts and subject area;
- Feeling of being involved into universities' innovations, ideas and current developments which are produced as a result of discussions.

To develop effective social networks that will successfully fulfill the set tasks it is necessary to apply modern scientific methods oriented to the work with the essential aspect of information. The most effective modern method of complicated ill-structured problems solution is the systemological classification analysis method relevant to the noospheric stage of scientific development [2].

Using of the systemological classification analysis in functions classifications construction allows to work out recommendations for the functions arrangement in a social network's menu as for their meaningful arrangement according to the classification developed. This natural arrangement will significantly reduce the user' load and improve his/her work [2].

The proposed social networking application in the field of distance learning involves not only training materials creation in the Internet environment and the individual work of students, but also the opportunity of direct contact between teachers and students at any time. This approach requires a significant increase teacher workday due consultation at a convenient time for students. This approach to the disciplines study allows organizing the

training in the form of a creative workshop, and that will greatly enhance the learning effectiveness through direct contact between teachers and students [2].

Knowledge-oriented social networks application in the learning process will help to organize tutoring students without their personal presence at the university, which will contribute to better employment, improve the training quality and will allow people with special needs to receive qualitative education in a comfortable environment [2].

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### **Analysis of learning organizations as a form of the organization of business**

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The emergence of a learning organization is considered as a natural reaction to the conditions of the transition from the information economy to the knowledge economy, in which there is a need for new organizational structures and tools. The unique feature of such an organization is not only the staff possessing their common experience and knowledge, but the culture of the organizational learning and development. The staff apprehends their job as a process open to continuous improvement [3].

"A learning organization is an organization that generates, obtains and distributes knowledge constantly and continuously, changes and improves its behavior depending on its own experience learning, creates new products and services, permanently using the employees' ideas and analyzing the customers' and partners' knowledge. As it can be seen from the definition, a learning organization is based on continuous control of its intellectual capital" [4].

The most famous model of a learning organization belongs to Peter Senge, this model is based upon five "skills" or "disciplines", which each employee of the organization should perfect himself/herself in, so that it becomes a true learning [5]: personal skills, mental models, common vision creating, group learning, system thinking.

For a clear and unambiguous understanding of the knowledge management system implementation process the standard based on the practical guide of knowledge management in Europe "Knowledge Management. Terms and definitions" [6] has been worked out, it is aimed at all business members, implementing a knowledge management system, both within individual companies and in their cooperation. Knowledge management is one of the least studied modern management structures. Increasingly, the problem of the knowledge management theory becomes a subject of economic debate, due to the increasing role and influence of knowledge as an economic resource for economic activities of different levels.

One of the main challenges of knowledge management is the clear definition of the terms and concepts and their systematization. Organizations (especially small and medium-sized enterprises) may undergo a significant economic impact, using common terminology and definitions. Therefore it is especially important to use systemological classification analysis, which allows to systematize conceptual knowledge in the most objective and justified way.

It is also advisable to use a good taxonomy (parametric classifications close to the natural ones) in learning process, and systemological classification analysis itself as a methodological framework and system tool to work with knowledge. It also will contribute to the development of organizations' staff and their competences.

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## The competences analysis for learning organizations

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Staff development is one of the most important activities of staff management and successful production factors. At the same time investing in staff development plays a greater role than investing in the production facilities development and improvement. Under staff development we understood a set of measures aimed at advanced training and employees' psychological characteristics improvement. This refers primarily to [7]:

- Training that provides the necessary knowledge, skills and experience in the form of general and vocational education;
- Training the mission which is to improve professional knowledge and skills;
- Advanced training which is defined as any professional reorientation. The purpose of advanced training is to enable employees to learn a new profession for them.

Education (training, seminars, distance learning, coaching, etc.) is always directed at the competences required to perform the tasks and achieve the desired results [8].

Formation of skills is the result of skillful use of different teaching methods altogether with the specific situation, values, skills and knowledge. For example, the successful management of the team may be the result of effective teaching methods such as interviews to evaluate the performance, workshops, providing "feedback", performance management [9]. Formation of skills is a complex process consisting of several stages.

At the first stage of formation of competences it is necessary to determine the competences themselves, the formation of which the organization requires on the basis of the system determination of the organization's mission.

When the competences are defined, it's time to train relevant knowledge and skills at the employees as well as to develop existing skills. It is necessary to determine the training methods and programs, as well as employees who are interested in the formation of a particular skill. Then you can proceed directly to the training and as a result, the formation of competences.

A competences formation model using the IDEF0 standard and the current system approach has been developed. Under the three-level representation of the model the system approach has been taken into account.

The model consists of four principal stages of the competences formation:

- Creating of a competences model involves creating a list of skills necessary to be formed at the organization in general;
- Creating of occupational skills profiles includes the process of identifying competences necessary to form at each employee individually;
- Corporate training includes training staff to develop the necessary competences;
- Checking learning outcomes includes examination to check the knowledge received by employees in the course of training.

The application of the systemological classification analysis and system approach in the competences formation can facilitate and accelerate this process. This in turn leads to rapid development and competitiveness of the organization.

### An example of the systemological classification analysis application

The analysis of the sources revealed that "competence" is a complex, multicomponent, interdisciplinary concept defined by many different definitions. The descriptions of this concept's idea are lax and differ in size, structure, semantic and logical structure, and not all of them are of generic character.

Specialization "Competences" is ill-structured and has no standard classification. However, the classifications according to different parameters such as the sharing competences level, the development the level, the essence and content, the emergency method etc. are possible.

To create a classification of the "Competences" subject domain and the detailed consideration of "Professional Competences" the systemological classification analysis method has been employed, so we have chosen "Function Purpose" as a basis for our classification (Figure 2).

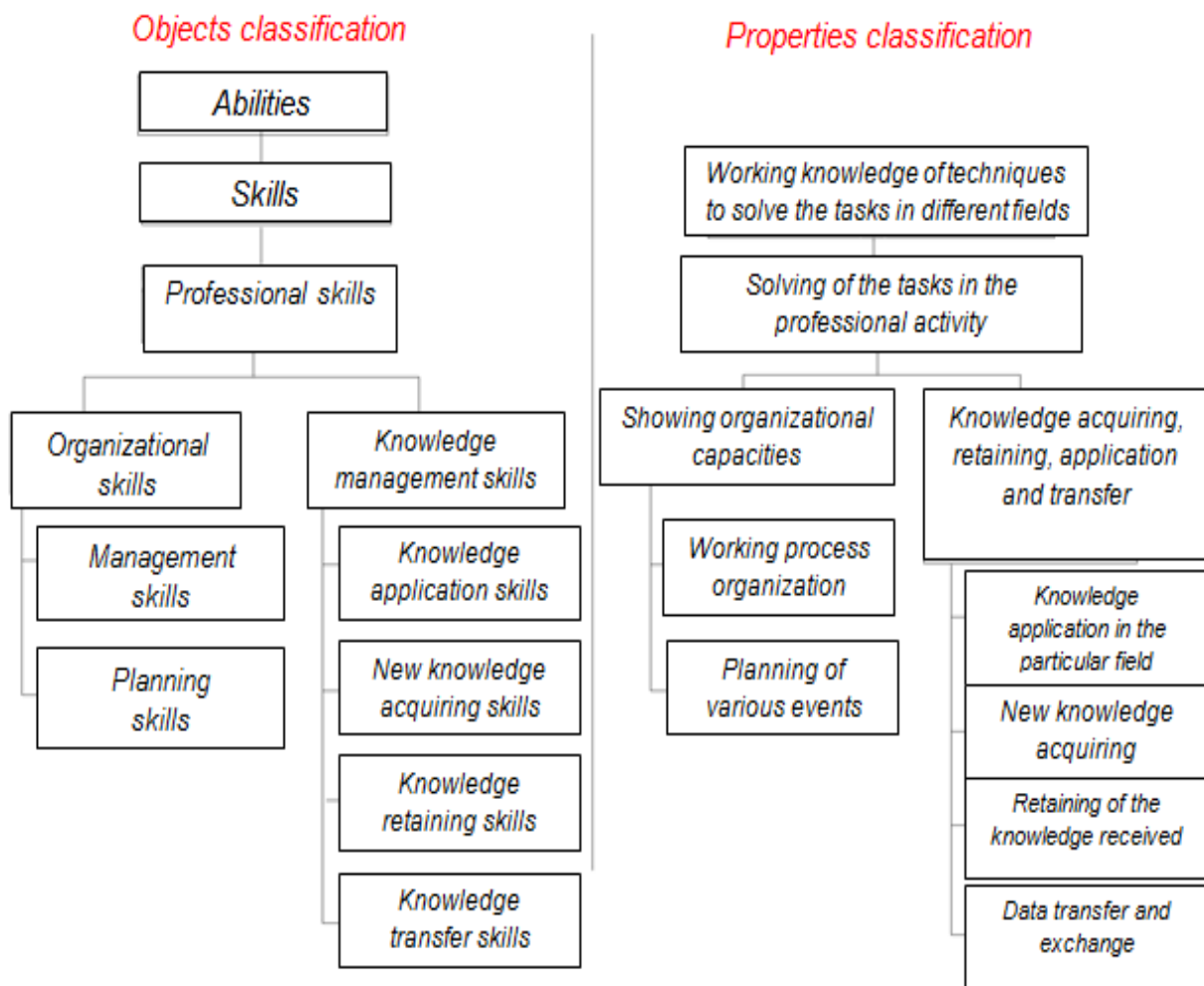


Figure 2, A Fragment of the "Competences" Classification

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The systemological cognitive method and knowledge management application is useful in various fields and improves problem solving, for example in the field of information security management, without which the successful development of any organization is not practically possible. In some companies, as yet, the knowledge management system is a sphere of activity of the HR management and IT department employees (activity provides the technical possibility of knowledge management system). The potential of the knowledge management system is not used to the full, knowledge, human factor (which affects the safety significantly) and employees' cognitive features are not taken into consideration in a proper way, information security professionals are not integrated enough into the work of the knowledge management system. Therefore, the issue of knowledge management related to the work of information security systems and the knowledge-oriented systemological cognitive approach application are pressing.

The systemological classification analysis method application and employees' cognitive features consideration as a bottleneck in the information security system are the effective way to solve the given task and result in the competitive advantage achievement.

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## The findings

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In the result of the conducted work the following findings has been obtained:

- The peculiarities, relevance and effectiveness of the knowledge-oriented system methods and techniques in the field of learning organizations and intellectual capital have been analyzed;
- The analysis of learning organizations has been held;
- The main aspects of niche social networks construction on the Internet based on system logical cognitive approach to improve the quality of the educational process have been studied;
- The classification of competences on the basis of the system logical classification analysis has been studied and developed; it is also used in the employees' competences formation modelling to increase the organizations' intellectual capital and to accelerate the learning process;
- The system logical classification analysis application allows systematizing knowledge reasonable and adequate for their subject domain, including ill-structured ones; to receive deep knowledge, to create parametric knowledge classification with objects' essential (ontological) properties.

The research in the considered subject area will allow implementing the developed models into the learning process effectively in order to improve the quality of training at learning organizations inter alia.

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## Acknowledgements

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The paper is partially financed by the project **ITHEA XXI** of the Institute of Information Theories and Applications FOI ITHEA and the Consortium FOI Bulgaria ([www.ithea.org](http://www.ithea.org), [www.foibg.com](http://www.foibg.com) ).

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