
THE NEW SCIENCE INTENSIVE STANDARD OF MASTER PREPARATION IN SPHERE OF COMPETITIVE INTELLIGENCE ON THE BASIS OF SYSTEMOLOGICAL KNOWLEDGE-ORIENTED TECHNOLOGIES

Mikhail Bondarenko, Nikolay Slipchenko, Ekaterina Solovyova,
Dmitriy Elchaninov, Olexiy Ukrayinets

***Abstract:** Methodological, theoretical and technological bases of the new branch standard of Ukraine higher education which regulates preparation process of masters - professionals in the information area and information analysts are considered. The new systemological knowledge-oriented technologies developed in KNURE which considerably surpass foreign analogues are put as the basis of training.*

***Keywords:** information analysis, consolidated information, systemology*

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Introduction

System formation of professional training and development of basic qualifying requirements to an analyst profession is a consequence of process of organizational registration of information analytical activity as independent profession and creation of professional analyst communities in Europe and America. Preparation of such specialists from education viewpoint is connected with difficult process of formation of a special kind system analytical and thus creative thinking, and also abilities to perceive and realize the modern world standards of information and organizational culture. On the basis of Kharkov national university of radio electronics (KNURE) the working group of the Ministry of Education and Science of Ukraine of the staff of Social Informatics (SI) Department, for development of the new science intensive educational standard of master preparation of on a new specialism 8.000012 «Consolidated information» has been created [Бондаренко и др., 2007]. Activity object of these specialists is consolidation (analytical synthetic processing) of information with the purpose of preparation of offers and information analytical documents about: administrative decisions acceptances; scientific and technical, innovative and industrial activity; competitiveness increase and the intellectual capital formation of organizational system, educational process, etc.; information analytical and system organizational support of legal persons activity with the purpose of its radical improvement on the basis of knowledge-oriented formation and forecasting of operative and strategic decisions variants. As a basis of creation and development of the given specialism the new methodology - functional systemology (the system approach of science development noosphere stage) is taken.

Information Analytical Activity

Today in the EU countries in information sphere specialists in the areas «Knowledge Management» and «Business Intelligence» are prepared in great demand. The absence in the CIS such specialists possessing modern mentality, causes a lot of social and economic problems set and has an adverse effect on investments efficiency into the CIS economy on the part of the European partners.

Such specialists carry out information analytical management support, using products and services of traditional information auxiliary services. But, unlike these services, they carry out «a task of qualitative-substantial transformation of information, functionally being related in this aspect with scientific (manufacture of new

knowledge) and administrative (development of decisions variants, scripts) activity». Thus the organizational separation of similar information analytical activity from administrative which important component it has been for many centuries is carried out [Сляднева].

Necessity of such separation is caused [Лифляндчик, Лиходедов]:

- Importance and responsibility of administrative decisions, especial in the sphere of government administration mistakes be very expensive or result in catastrophes;
- Now huge volume of information to be processed for selection and ground of the correct decision, especial by at the top levels of management;
- Lack of time at executives, especial by in the sphere of government administration who works in conditions of chronic overstrains;
- That, civil officers and managers, as a rule, «are not professionals in information area and do not possess skills of data collecting, processing and analysis» [Лифляндчик, Лиходедов], [Забелло].

Process of organizational registration (institutionalization) of information analytical activity as independent profession in Europe and America has resulted already more 20 years ago in formation of professional community, professional training system and development of the basic qualifying requirements to the analyst profession. The international community of such professionals - «The Society of Competitive Intelligence Professionals» (SCIP), - 7000 members from 64 countries of the world, has existed since 1986 [Прескотт, Miller, 2003]. And in Russia in August, 2002 «The Russian Society of Competitive Intelligence Professionals» (RSCIP) was created in a similar way.

For the description of given professional work of SCIP the term «Intelligence Process/Cycle» (IC) by which transformation process of data in information, then - in knowledge and, finally, - in "Intelligence" (see Fig. 1) is used. IC, from SCIP viewpoint, consists of four steps:

- Revealing initial requirements and data;
- Formation of information resources;
- Extraction and acquisition of knowledge;
- Finishing information.

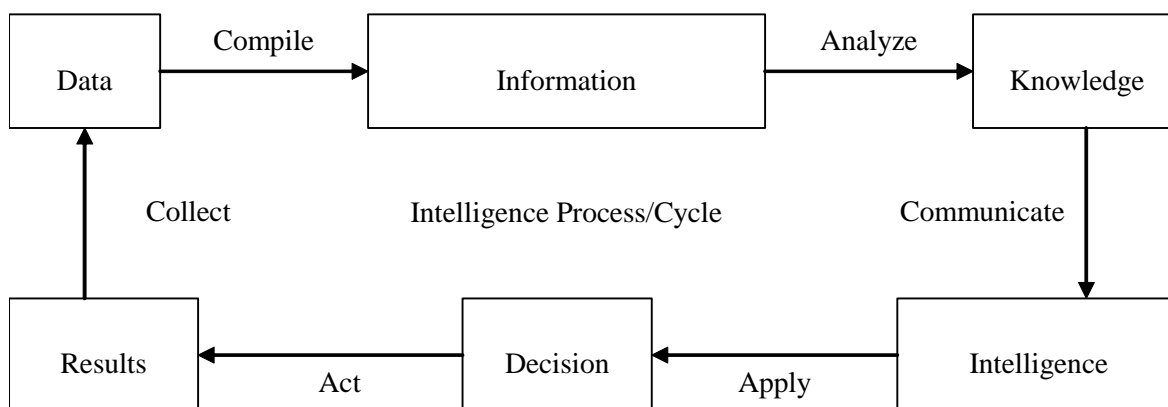


Figure 1. Transformation process of the data in "Intelligence"

Besides the term «Competitive Intelligence» (CI) for designation of «the leading (directing) information and knowledge about participants and manufacture subject which maximizes competitive advantage» is used. This information and knowledge represent the finished product of information analyst activity, in other words analytical

document for management which contains «the intelligent data based on the collected, evaluated and interpreted facts, stated in such a way that their value for the decision of any specific target is clearly visible» [Баяндин].

The Consolidated Information

From the education viewpoint, preparation of such specialists is connected with difficult process of formation of a special kind of system analytical and thus of creative thinking, and also ability to perceive and realize the modern world standards of information and organizational culture.

As a result of the given situation analysis, the staff of Social Informatics (SI) Department and Scientific-educational Laboratory of Knowledge Acquisition (SUL KA) of the Kharkov National University of Radio Electronics (KNURE) in cooperation with UkrISTEI and National University «Lvov polytechnics» at the support of the Standardization Department of Scientific-methodical Center MES of Ukraine and Scientific Research Institute of Social-labor Relations a new subclass 2433 - «Professionals in the information area and information analysts» (change №5 2002) was offered and introduced in the Ukraine Profession Classifier.

This has allowed the Ministry of Education and Science of Ukraine with the consent of the Ministry of Ukraine to accept education-qualifying characteristic (EQC) and education-professional program (EPP) of a new specialty «The Consolidated Information» (8.000012) which has been developed by the staff of SUL KA and SI Department (Order MES №995 from 9.11.2007). Activity Object of these specialists according to appropriated qualification (the group 2433.2 - «Analyst of Consolidated Information») is: «Consolidation (analytical synthetic processing) of information with the purpose of preparation of offers and information analytical documents about: administrative decisions acceptances; scientific and technical, innovative and industrial activity; competitiveness increase and the intellectual capital formation of organizational system, educational process, etc.; information analytical and system organizational support of legal persons activity with the purpose of its radical improvement on the basis knowledge-oriented formation and forecasting of operative and strategic decisions variants».

The understanding by founders of domestic theoretical informatics the information consolidation process as «phase transition of knowledge in power» [Каныгин, Калинич, 1990] allows to consider the term «consolidation of the information», as literary translation of the term «intelligence process/cycle», and the term «the consolidated information», as translation of the term «competitive intelligence».

Such understanding of terms allows comparing professional characteristic Competitive Intelligence Professionals (www.scip.org/education) and the characteristic project of domestic Information Analysts (2433.2, State classifier (SC) 003-95). Comparison shows, that substantially these are completely identical professions [Bondarenko, etc.].

Systemology - Scientific Base of Information Analytical Activity

In the basis of creation and development of the given specialism the new methodology - functional systemology (the system approach of science development noosphere stage) incorporated by G.P.Melnikov [Melnikov, 1988] is used.

In connection with the fact that the terminology of the suggested systemological approach is not widely known, we will give a list of terms needed to understand the essentials of the present investigation [Melnikov, 1988], [Bondarenko et al, 1996].

System - an object the properties of which are determined by a function, which amounts to maintaining certain properties of an object at a higher level. This object is a supersystem in relation to the object (system) under consideration. Substance of a system - elements or components of the system, is usually considered as subsystems. Structure of a system is the scheme of relations and interactions of a system's substance. Property of a system (valence) is the ability to maintain (in certain conditions) relations of one type and to prevent realization of relations of other types. Functional property of a system is a property that a system must possess in order to perform its functions; the ability to maintain relations (flows) on the basis of which interactions that are important for the supersystem occur between the system and surrounding systems. Extensional valence - a

property realized in the form of a relation of the corresponding quality and constituting one of the varieties of reality. Free valence is a property only as an ability, not manifested in an existing relation and constituting one of the varieties of possibility (weak: potential, strong: intentional). External determinant of a system is the main reason for system formation: the supersystem's functional need for certain interactions of the system under consideration with other (surrounding) systems of this supersystem, which dictates the choice of the system's determinant.

By the staff SUL KA of KNURE SI Department original knowledge-oriented systemological technologies have been created, approved and developed [Соловьева, 1999], [Маторин, 2002], [Бондаренко и др, 2004], [Bondarenko et al, 2007]. Acquiring of new knowledge on the basis of a new method and criteria of natural classification allows to model most objectively deep conceptual knowledge in view of objects essential properties and to develop powerful ontology of ill-structured subject domains.

The perspective technology of organizational system modeling and analysis, material and information processes [Маторин, 2002], [Bondarenko and др, 2004], [Bondarenko et al, 2006], allows to consult with challenges of putting in order in the working organization, designing of new organization, and also forecasting of its development. In particular, it provides construction of models which allow:

- In the automated way to determine integrity and correctness of normative documents from the viewpoint of an opportunity to construct under the descriptions incorporated in them and requirements the working organization;
- to allocate formally the divisions and services which have not been connected with activity of the organization as a whole;
- To determine the concrete contribution of division or service to the general result of work;
- In the automated way to develop recommendations on maintenance of functional balance at interaction of divisions and staff.

The given technology uses the methodological instrument of systemology, the mathematical instrument of the patterns theory and original complete (not theoretical plural) representation of organizational system with the help of three characteristics: "Unit", "Function" and "Object" (UFO-ANALYSIS). For automation of modeling with the help of the UFO-ANALYSIS the program CASE- tool - "UFO-toolkit" (the copyright certificate №7941) has been designed and realized. The given means provides conceptual modeling of knowledge about subject domain as classification of material and information communications / streams and libraries of UFO-ELEMENTS, and also automated visual diagram modeling and simulation of system in view of external (functional) and internal (supported) communications.

Steady development of social systems: an individual social organization, each region, the state as a whole and, finally, all mankind is a problem solution of which by means of the traditional system analysis does not exist yet. It is possible to explain it that the methods of the traditional system analysis are more appropriate for the solution of problems which arise in technical systems and can be described by formal quantitative models precisely enough. Social systems are so complex, that the adequate quantitative model can be constructed only in very rare cases, and if it is possible, its analysis is simply impossible. Therefore for modeling and analysis of social systems the qualitative methodology, as the modern system analysis - systemology is required.

In the works [Bondarenko, Ельчанинов, 2002], [Bondarenko, Ельчанинов, 2003] the systemological treatment of a problem of social systems steady development, different from existing ecological and economic by the greater generality and universality is presented. The main idea of developed systemological theory of steady development is that no system appears by chance, but in connection with requirements for it of higher level system (supersystem). Thus at the supersystem there are quite certain requirements to functioning system (functional inquiry).

The system will develop steadily if it satisfies functional inquiry of the supersystem. If the system deviates from a required condition, the supersystem will direct system to the necessary condition through external influences on the system. The system task is to analyze external influences and to reveal required condition by the supersystem.

Branch Standard of Information Analysts Training

This standard is distributed to system of higher education and also the ministries, departments, associations, enterprises, the organizations of different ownership forms, other legal persons who prepare specialists of education-qualifying level of master according to the specialism 8.000012 «Consolidated information» of preparation specific categories of full higher education of qualification 2433.2 «Analyst of the consolidated information» with the generalized activity object: consolidation (analytical synthetic processing) of information with the purpose of preparation of offers and information analytical documents about: administrative decisions acceptances; scientific and technical, innovative and industrial activity; competitiveness increase and the intellectual capital formation of organizational system, educational process, etc.; information analytical and system organizational support of legal persons activity with the purpose of its radical improvement on the basis of knowledge-oriented formation and forecasting of operative and strategic decisions variants.

The specialist is prepared to work in all kinds of economic activities according to SC 009-2006.

The specialist is capable to carry out specified in SC 003:2005 professional work: 2433.2 «Analyst of consolidated information».

The specialist can take up, for example, primary posts of workers of information service (department), consulting service, information analytical department (service), department of strategic planning and forecasting, department of reengineering, department of industrial systems organizational designing.

This standard (EQC) establishes:

- Professional appointment and conditions of use of higher educational institutions graduates of the certain specialism and education-qualifying level as the list of primary posts, production functions and typical tasks of activity;
- Educational and qualifying requirements to higher educational institutions graduates as the list of abilities and skills to solve a task of activity;
- Requirements to certification of education quality and vocational training of higher educational institutions graduates;
- Responsibility for quality of education and vocational training.

Typical tasks of the consolidated information analyst activity:

- Designing a perspective image of organizational system and a formulation of its mission with the help of the information consolidation;
- Research and development of models of available and future organizational system;
- Designing business - processes with the help of consolidation of the information and knowledge;
- Research and development of schemes of information and material streams;
- Choice and application substantiations of information systems and technologies, planning of their development;
- Development and substantiations of offers on improvement of the personnel organizational interaction system, management structure and processes commands organization;
- Performance organization of the project on reengineering;
- Monitoring of organizational system functioning;
- Administration of information resources;
- Support of development, introduction and operation process of information systems and technologies.

This standard (EPP) establishes:

- A normative part of the training content in educational objects which mastering provides formation of skills system according to requirements of education-qualifying characteristics;
- The recommended list of disciplines and practices;

- Normative term of training under the internal form of training;
- Normative forms of the state certification.

The recommended list of disciplines and practices:

- Information technologies of business organization;
 - Technology of knowledge management;
 - Technologies of information management;
 - Decision-making support technologies;
 - Introduction in a specialism (Competitive intelligence);
 - Foreign language;
 - Predegree practice and degree work.
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Conclusion

The analysis of educational specialism introduced recently and perspective directions of researches at European universities has shown that the most essential attention is given to so-called "information" specialisms and sciences. Now in the majority of the European universities the preparation of bachelors and masters of information sciences is carried out. Moreover, scientific degrees in information sciences have been awarded for a long time. Thus in Europe (and also in the USA) areas of knowledge and activity, not connected directly with technical problems, for example: provision of scientific and technical information, social informatics, knowledge engineering, design management etc traditionally are considered to be information sciences. Key roles in information sciences in the West play such directions as «Knowledge Management» and «Business Intelligence». Besides it is necessary to emphasize once again the importance of specialist preparation in information sphere now. The thing is that our backlog in the material sphere, determining a low level of our life, can be some time overcome. Backlog in information sphere can turn back backlog forever.

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Authors' Information

Mikhail Bondarenko - Rector, Kharkov National University of Radio Electronics, Lenin Ave., 14, Kharkov, 61166, Ukraine; e-mail: rector@kture.kharkov.ua

Nikolay Slipchenko - Chief of Scientific Department, Kharkov National University of Radio Electronics, Lenin Ave., 14, Kharkov, 61166, Ukraine; e-mail: slipchenko@kture.kharkov.ua

Ekaterina Solovyova - Social Informatics Department, Kharkov National University of Radio Electronics, Lenin Ave., 14, Kharkov, 61166, Ukraine; e-mail: si@kture.kharkov.ua

Dmitriy Elchaninov - Social Informatics Department, Kharkov National University of Radio Electronics, Lenin Ave., 14, Kharkov, 61166, Ukraine; e-mail: elchaninov@kture.kharkov.ua

Olexiy Ukrayinets - Social Informatics Department, Kharkov National University of Radio Electronics, Lenin Ave., 14, Kharkov, 61166, Ukraine; e-mail: si@kture.kharkov.ua