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SYSTEM ANALYSIS IN TRANSPORT INFRASTRUCTURE

СИСТЕМНИЙ АНАЛІЗ В ТРАНСПОРТНІЙ ІНФРАСТРУКТУРІ

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Abstract: The article deals with the system of training of analysts and proposes the analytical structure of the transport and road complex with the corresponding analytical centers in each of the regions of the country, which have the principal novelty of research on rational forms and methods of information and analytical activity for improving the infrastructure projects and programs management and it is the perspective of creation of industry analytical elite.

The object of the research - it is a system for the training of analysts majoring in “System analysis in transport infrastructure” for the transport and road complex of the country.

The purpose of work – it is to identify the main program goals of applied system analysis in the transport infrastructure and strategic ways for the creation of analytical elite of the transport and road complex of the country.

Method of research - it is a systemic, conceptual and software approaches.

Suggested industry analytical structure has principled novelty toward the training of systemic analysts, providing with them the transport and road complex of the country, the continuous monitoring of the state and expert evaluation of the important decisions, the development of alternative infrastructure projects and programs in related fields of transport and road industry, that allow qualitatively to improve decision-making at strategic, tactful and operational levels of the management toward infrastructure projects.

The support from the side of interested parties (Stakeholders) of the Ministry of Infrastructure and Ministry of Education concerning guaranteed annual state order of stated specialty “System analysis in transport infrastructure” in National Transport University will allow significantly increase the analytical potential of transport and road complex and country as a whole.

Further development of the object of research – it is the state support for the system of the training of analysts for the transport and road complex of the country and suggested analytical system is the basis for the development of related fields of transport and road industry and support of public initiatives in improving the management toward infrastructure projects and programs and the creation of industry analytical elite.

Key words: system analysis, infrastructure of transport, transport and road complex, industry analytical center, analytical elite.

Formulation of the problem.

Today's scientific tasks are aimed at ensuring the reliable functioning of the transport-road complex (TRC) of the country as a whole and in the areas of research of the state of materials in structures and destructive processes, development and improvement of means and materials for increasing the reliability and durability of building structures, buildings and structures using modern construction technologies.

The use of the Road Fund and the annual increase in funding proves that the authorities have understanding attitudes to solving the problems of the country's road industry. Recent changes to the Budget Code and the state budget for 2020 allow “Ukravtodor” to borrow under state guarantees and raise additional funds for the repair of about 6,500 km. and construction of at least 4,000 km. of roads, construction of several junctions on the most dangerous sections of general-purpose roads, bridges in Zaporizhzhya, Mykolayiv and Kremenchuk, as well as 9 bypass roads in Ukraine. 34 road projects in 14 regions of the country have already been started this year. [1]

Positive developments in financing require an appropriate attitude to the profile staffing providing of the country's road industry, namely the proper support of innovative projects for the design, construction, operation, maintenance, repair, and reconstruction of transport infrastructure facilities in accordance with the requirements and provisions of applicable legislative and regulatory legal acts of Ukraine.

Therefore, the industry needs the immediate provision with appropriate specialists to carry out professional tasks and responsibilities of an applied nature regarding the rational strategic, tactical and operational management toward infrastructure projects and their successful implementation. This is about the perspective direction for the training of highly qualified personnel, namely system analysts who combine the professional competences of related fields of transport and road management. The implementation of this educational project will solve the problems of providing the industry with analysts of transport infrastructure systems and the creation of analytical elite of the TRC of the country, which is capable of solving strategic goals.

Analysis of the recent research and publications.

The carried out analysis of research and publications revealed the following. In work [2] it is discussed the basic conceptual approaches toward understanding the nature of public administration analytics as a system that combines problematic, methodological, information-technological, organizational, value-normative, personnel aspects. It is emphasized that the importance among the rules of the social phenomenon makes the institutionalization of analytical activity, which is becoming a widespread and influential type of socio-economic activity and is increasingly based on the values, norms and standards that are formed in society.

In accordance with this rule, there, in our country, is a need to intensify intellectual activity in general and analytical in particular. This is possible only if the country creates its policy in the field of analytical intelligence. In work [3] it is proved that the professional and activity part of the analytical component is a set of special competencies, which are invariant, determine the competences related to the knowledge of the apparatus of performing analytical functions. These include information-analytical, accounting-analytical, financial-analytical, mathematical or quantitative-analytical, system-analytical and IT-analytical. All analytical competencies form the analytical competence of the specialist, which will allow specialist to make careful decisions in order to improve productivity at strategic, tactical and productive levels. Based on the theoretical analysis of the basic concepts of the research, analytical competence is defined as an integrative professional quality of a person, reflecting, on the one hand, the ability to identify an information need, to search the information, and to have effective work with it using the processes of analysis and synthesis; the ability to get general successful indicators based on accounting and financial and quantitative analysis of the activity and to conduct the evaluated conclusions, the ability to research systematically and to evaluate situation; and, on the other hand, the ability of the individual to use computer technology and telecommunications technology as a tool for analytical research and use them in professional and daily life for making of management decisions. In work [4] it is researched the normative regulation and the current situation for training analysts of the

information field. The raised question is about the classification features of the field of knowledge and specialty of persons who are professionally engaged in analytical activity. There are differences in national classifiers; resolutions of the Cabinet of Ministers of Ukraine concerning the training of relevant specialists. It is noted that there is no mechanism for calculating the need in such specialists. Issues of activity of the Ministry of Information Policy of Ukraine are separately raised. The division of analysts' competences by educational level is proposed according to the transnational and national qualifications limits. The conclusion about the fatal consequences of laying the emphasis of training analysts of the information field on self-education has been made. In work [5], the evolution of system analysis from ancient Greek philosophy to synergetic is discussed. The transition from authoritarian public administration to democratic governance is analyzed. The dependence of changes in systemic and state management theories on the development of economic sectors is shown. The choice of a systematic approach as a theoretical and methodological basis of state management is substantiated. It is emphasized that the current crisis of the classical theory of state management is connected with the rapid growth of the tertiary post-industrial sector of the economy (production of services). The way out of this crisis is to develop ways of democratic governance on the basis of decentralization and forming partnerships between government and citizens based on their self-organization and self-government, the most famous of which are the concepts of New Public Management and Good Governance. The large number of unsuccessful attempts of using classical systems approaches and methodologies for the solution of state problems makes us search the new systems theories, the most popular of which is synergetic. The formation of the Quaternary sector of the economy makes the systematics become the theoretical and methodological basis of state management. The perspectives of further exploration in this direction are in connection with the fact that the five-year economic sector will be based on motivations. Charlatan commercial religious sects, PR agencies, astrological communities, and the similar structures are already looking for ways for this activity to carry commercial nature. Therefore, it is necessary to investigate how these changes will affect the practice and theory of state management, which system theories support the solution of new problems related to the evolution of human creative abilities.

Formulating of the goals of the article.

Based on the above, the purpose of this article is to determine the main programmatic goals of applied system analysis in the transport infrastructure and strategic directions of creation of the analytical elite of the country’s transport and road complex.

Outline of the main research material.

It should be noted that global trends of using the modern technologies in road construction, new methods (including Foresight methods), strategic, tactical and operational management toward infrastructure projects require a respective level of professional training of system analysts, especially analysts of transport infrastructure systems.

They are future high-class specialists who are ready to fulfill the tasks of the customers within the requirements and provisions of the current legislative and regulatory acts.

In view of the above, in 2017, on the basis of the fundamental theoretical and applied platform created by the Department of Airports of the National Transport University (NTU), training of analysts in the specialization "System Analysis in Transport Infrastructure" was started. Considering the educational program, we will define its uniqueness and differences. The Bachelor's program consists of the following educational components: theoretical part, practice and final certification.

The theoretical part is the disciplines (modules) related to the normative part of the program, and the disciplines (modules) related to its selective part, which is formed by NTU and provides the opportunity to implement bachelor programs that have different professional directions of education within the same specialty. The program includes blocks of the selective part toward the specialty and for specialization "System analysis in the transport infrastructure".

The program includes the disciplines of the cycle of humanitarian and socio-economic disciplines (9%), the cycle of disciplines of mathematical and natural and scientific training (21%), the cycle of vocational and practical training toward the specialty (45%), the cycle of vocational and practical training in special activities (25%).

Practices are fully relevant to the selective part of the program. The program of practice provides practical acquaintance and acquisition of practical skills toward the specialty and professional direction.

Final certification has deal with the normative part of the program and ends with the assignment of the qualification specified in the list of specialties and directions of higher education training.

The training time and the time of organization of the program permit to have internships (or part of training) abroad on the basis of individual grants.

The educational program includes the implementation of a competent approach to the organization of the educational process, which allows to present the results of training with the help of an integrated system of competences and consists in the ability to solve complex specialized problems and practical problems of system analysis in professional activity or in the process of learning, which involve the using of theoretical provisions and methods of system analysis and information technology and is characterized by the complexity and uncertainty of the conditions.

The focus of the program is on the ability to use the technologies of analysis, modeling, forecasting, design and decision making in the field of construction of transport infrastructure objects. The educational program involves the acquisition of social skills (soft skills). Comparison of program specialized professional competencies and learning results are presented in Table 1.

At the same time, the conducted analysis of the list of competences of the graduate identified on the basis of the standard of higher education of Ukraine [6] majoring in the specialty "System analysis" for the first (bachelor) level of higher education, approved and put into effect by the order of the Ministry of Education and Science #1245 as of November 13, 2018 did not identify the methods, techniques and technologies of a psychological nature that a higher education graduate should master for using in practice.

Table 1 – Program specialized professional competencies and results of learning

Таблиця 1 – Програмні спеціалізовано-професійні компетентності та результати навчання

Program specialized professional competencies	Program learning results
1	2
ability to analyze, use the provisions of the legislative and regulatory framework in the field of design, construction and operation of transport infrastructure objects and technologies with regard to their reliability	be able to analyze, use the provisions of the legislative regulatory framework in the field of design, construction and operation of transport infrastructure objects and technologies with regard to their reliability
knowledge of engineering research methods, design technology using universal and specialized software and computer systems and systems for automated design of transport infrastructure objects	know the methods of engineering research, design technology using universal and specialized software and computer systems and systems of automated design of objects of transport infrastructure
knowledge of methods and technology of operation, reconstruction and reliability of transport infrastructure objects	to know methods and technology of operation, reconstruction and reliability of transport infrastructure objects
ability to use the requirements of occupational safety, fire safety, life safety and environmental protection when designing, constructing, operating and reconstructing transport infrastructure objects	be able to use the requirements of occupational safety, fire safety, life safety and environmental protection when designing construction, operation and reconstruction of transport infrastructure objects
ability to carry out and organize the technical operation of transport infrastructure objects, to ensure the reliability, safety and efficiency of their work, to analyze the technical and economic efficiency of their work and development of measures to improve them	be able to carry out and organize the technical operation of transport infrastructure objects, to ensure the reliability, safety and efficiency of their work, to analyze the technical and economic efficiency of their work and to develop measures for its improvement

Continued table 1

1	2
knowledge of the organizational and legal grounds of management and business activity, planning of staff work and methods of implementing innovative ideas, organization of production and effective management toward people's work during the design, construction and operation of transport infrastructure objects	to know organizational and legal grounds of management and business activity, planning of staff work and methods of implementation of innovative ideas, organization of production and effective management toward people's work during the design, construction and operation of transport infrastructure objects
knowledge of the nomenclature of building materials and products of inorganic and organic nature, their technical and operational properties, features of manufacturing and rational use depending on the conditions of use, operation and taking into account economic appropriateness, environmental safety, economics of nature management and performance of technical and economic analysis and calculation of indicators of production of different types of building materials, products and structures	to know the nomenclature of building materials and products of inorganic and organic nature, their technical and operational properties, features of manufacturing and rational use depending on the conditions of use, operation and taking into account economic appropriateness, environmental safety, economics of nature management and to perform technical and economic analysis and calculation of indicators of production of different types of building materials, products and structures
knowledge of raw material base, nomenclature and grounds of technologies of getting all types of building materials, products and structures, design of technological lines and enterprises, their production using local raw materials and industrial waste, designing of effective technologies of monitoring of their reliability	to know the raw material base, nomenclature and grounds of technologies of getting all types of building materials, products and structures and to design technological lines and enterprises, their production using local raw materials and industrial waste, to design effective technologies of monitoring of their reliability
knowledge of the grounds of production processes, principles and methods of their organization in the main, collateral and service units of enterprises, methodology of research and design of production processes and systems and theoretical rules of the flow of elementary processes and basic stages of technological process of manufacturing building materials, products and structures, principles of optimization of technological solutions and calculating the parameters of technological processes and apparatus and assessing their impact on the environment	to know the basics of production processes, principles and methods of their organization in the main, collateral and service units of enterprises, methodology of research and design of production processes and systems and theoretical rules of the flow of elementary processes and basic stages of technological process of manufacturing building materials, products and structures, principles of optimization of technological solutions and calculating the parameters of technological processes and apparatus and assessing their impact on the environment
ability to determine the basic properties of building materials, products and structures using modern test methods, to determine the dependence of the properties of materials on their composition and structure, as well as their manufacturing technology for the rational and environmentally friendly use of building materials, products and structures for objects of transport infrastructure	be able to determine the basic properties of building materials, products and structures using modern test methods, to determine the dependence of materials properties on their composition and structure, as well as their manufacturing technology for the rational and environmentally friendly use of building materials, products and structures for objects of transport infrastructure

Continued table 1

1	2
knowledge of technology of production and utilization of industrial waste toward the industry fields, main measures of utilization, recuperation and recycling of waste	To know the technology of production and utilization of industrial waste toward the industry field, main measures of utilization, recuperation and recycling of waste
Ability to conduct monitoring and evaluation of the reliability of the condition of structural elements of transport infrastructure objects	be able to conduct monitoring and evaluation of the reliability of the condition of structural elements of transport infrastructure objects
ability to develop technical documentation and draw up work schedules, instructions, plans, budgets concerning monitoring of the reliability of the condition of the structural elements of transport infrastructure objects	be able to develop technical documentation and draw up work schedules, instructions, plans, budgets concerning monitoring of the reliability of the condition of structural elements of transport infrastructure objects

For comparison, the Institute for the Future report presents a map of future professional skills [7], which defines current skills in the context of scientific and technological progress: critical thinking; innovative adaptive thinking and the ability to work with modern media resources; calculated thinking; project thinking; managing toward cognitive load; social intelligence; intercultural competence; ability to work remotely; transdisciplinarity.

Therefore, in order to receive full professional training in the curricula of future system analysts, it is necessary to add a block of psychological and pedagogical disciplines, such as "Psychology and pedagogy", "Psychology of personality", "Psychology of effective communication", "Psychology of leadership, influence and power", etc. [8], which gives great impetus to the development of the humanitarian component of higher education, especially modern philosophy [9]. As a result, graduates are formed knowledge in the field of psychology of personality, cognitive processes, psychology of activity, psychology of a group (team), psychology of human relations; ability to work in a team, create conditions for cooperation; management skills toward workgroup and teamwork skills, reflecting a particular application focus for future communication of system analyst.

In view of the above, it becomes an urgent need to develop new conceptual approaches to the creation of the industry analytical structure, that has, in its work, a fundamental novelty toward the continuous monitoring of the state, expert assessment of priority decisions, development of alternative infrastructure projects and programs in related fields of transport and road industry and will allow qualitatively to improve work concerning decision-making at all levels of management: strategic, tactical and operational.

It is proposed to establish an industry analytical center of the country's transport and road complex (IAC) with corresponding branches - regional analytical center (RAC) in each of the regions, which have a fundamental novelty toward conducting research with rational forms and methods of information and analytical activity, Figure 1.

In order to ensure reliable functioning of the IAC it is important to form a team of like-minded people and to solve the following strategic tasks:

- creation of analytical tools for the implementation of infrastructure projects;
- creation of common infrastructure and methodology of expert-analytical activity of regional centers for solving problems at the place and promotion of their own infrastructure projects in the regions;
- creation of a modern and powerful analytical support for the warning management system, using predictive analytics technologies based on Big Data to expand the network of expert groups (centers);
- creation of a multilevel monitoring system of available information toward the implementation of infrastructure projects in the regions, the country as a whole and in the world. The monitoring product will be

constantly updated Profile Collection (Atlas) of maps, illustrations, tables, schemes toward solving problems of transport infrastructure systems;

- training and professional training of analysts of transport infrastructure systems for public, local and private management on the basis of the created fundamental theoretical and applied platform at the department of airports of NTU, where training toward this specialization is conducted since 2017.

The conceptual decision for creation and functioning IAC is to involve a wide range of experts and organizations in the expert-analytical activity, to establish relations with a number of leading regional and foreign mass media, news agencies, scientific and research and project institutes, the Administration of President, the Government, local state administrations, self-government bodies.

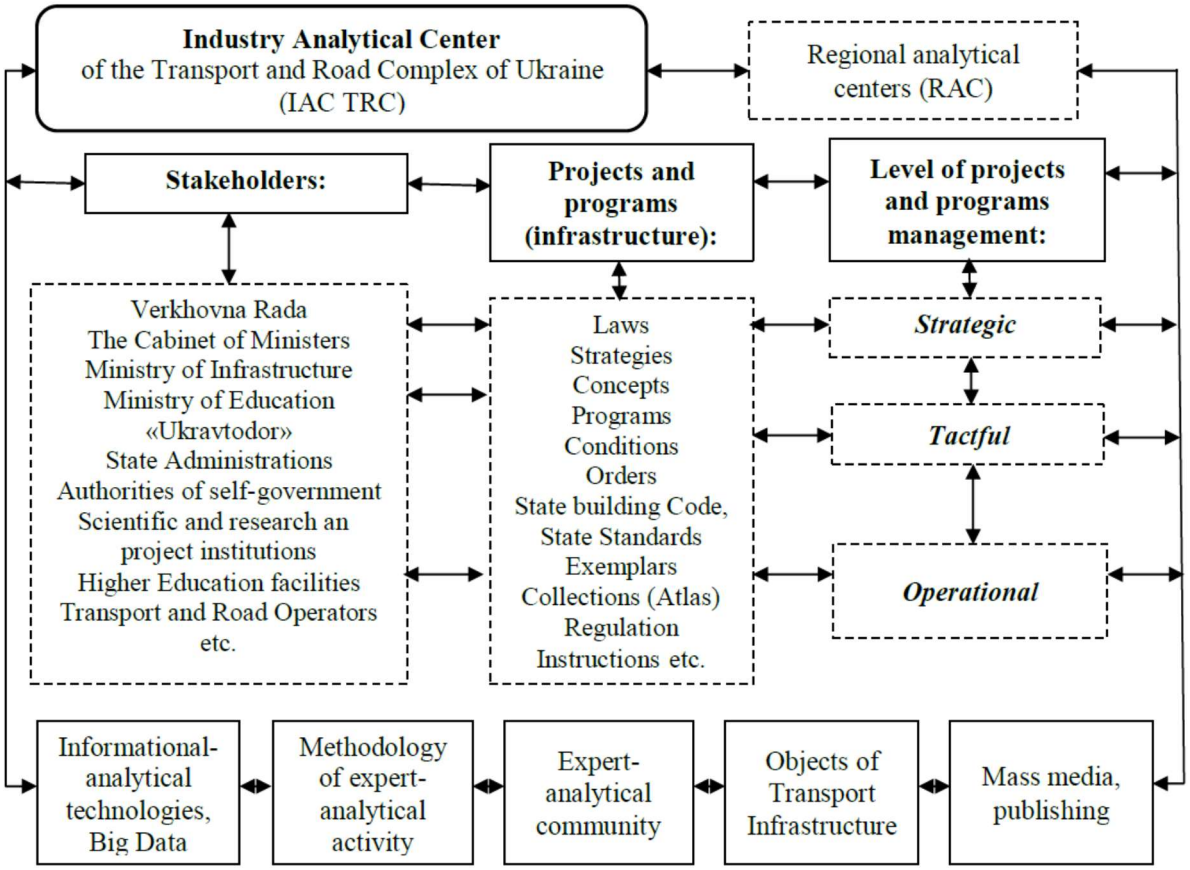

Figure 1 – The conceptual scheme of the analytical structure of the transport and road complex of the country
Рисунок 1 – Концептуальна схема аналітичної структури транспортно-дорожнього комплексу країни

The main idea is to develop and implement a program to build a highly efficient self-structured hierarchical multi-purpose system that will generate the analytical elite of the TRC of the country and is designed to develop and support public initiatives in improving the management toward infrastructure projects. Using this system will significantly enhance the analytical potential of our country as a whole.

Your mobile publishing department and the staff of contracted journalists are required. Due to the formation and maintenance of appropriate databases, the use of advanced information and analytical technologies IAC will be able to conduct deep analytical studies of a multidisciplinary nature with the involvement of necessary specialists (researchers, analysts, consultants). Also, IAC will take into account the world experience of similar structures, in particular, RAND Corporation and DARPA (USA) [10].

Conclusions from this research.

Global trends in the direction of modern technologies in the road construction, the use of new methods (including Foresight methods), strategic, tactical and operational management toward infrastructure projects require an appropriate level of professional training of system analysts.

The programs of academic disciplines in “System Analysis” course should take into account the requirements of the present and perspective future and special applied orientation and emphasize on the training of competitive specialists for the analytical structures of the TRC of the country.

There is a clear example of solving the problem of providing of TRC with high-qualified personnel by the department of airports of NTU, on which in 2017 it was started the training of analysts in the specialty "System analysis in transport infrastructure" on the basis of the created fundamental theoretical and applied platform.

The uniqueness of the academic, practical and applied orientation of the educational program ensure a relevant teaching staff of professional practitioners in close collaboration with interested parties (stakeholders), among whom are relevant government officials, representatives of local authorities and state administrations, industrial ministries, agencies, services and scientific and research institutions, higher education institutions, transport infrastructure facilities, transport and road operators of different forms of ownership.

The analysis of the list of competences of the graduate, identified on the basis of the higher education standard of Ukraine toward the specialty "System analysis" and the report of Institute for the Future concerning future working skills for 2020 proves the need to add a block of psychological and pedagogical disciplines in the curricula in order to receive a full vocational training reflecting the special application orientation for communication of future system analysts.

Considering the strategic importance of system analysts for TRC and the country as a whole, the Ministry of Education and the Ministry of Infrastructure should provide an annual state order of 10 people for the declared specialization "System Analysis in Transport Infrastructure".

The creation of a IAC will be the basis for the development of related industry of transport and road industry and the support of public initiatives in improving the management toward infrastructure projects.

The functioning of the IAC will give impetus to the creation of the analytical elite of the TRC of the country through the involvement of a wide range of experts-analysts, team nature of work, institutionalization of expert-analytical fellowship, using of network structure.

The purposeful and systematic promotion of intellectual achievements of the national applied school of system analysis in the transport infrastructure among compatriots abroad should be considered as an important direction of activity.

References

[1] Nova dorozhnya stratehiya 2020: yak uryad planuye «zshyvaty» dorohamy vsyu krayinu [New Road Strategy 2020: How the Government plans to "sew together" with roads all the country]. URL: https://www.epravda.com.ua/publications/2020/01/27/656329/ [in Ukrainian].

[2] Surmin Yu.P. (2007) Analityka derzhavnoho upravlinnya: sutnist′ i tendentsiyi rozvytku [State management Analytics: Essence and Trends of Development] / Yu.P. Surmin // Instytut problem derzhupravlinnya ta mistsevoho samovryaduvannya NADU - Institute of Problems of Public Administration and Local Self-Government of NADU. – 21p. URL: http://academy.gov.ua/ej/ej5/txts/06sypdsv.htm [in Ukrainian].

[3] Polovenko L.P. (2012) Analitychna kompetentnist′ - klyuchovyy skladnyk profesiynoyi kompetentnosti maybutnikh fakhivtsiv z ekonomichnoyi kibernetyky [Analytical competence is a key component of the professional competence of future specialists in economic cybernetics] / L.P. Polovenko // Problemy formuvannya natsional′noyi elity. Teoriya i praktyka upravlinnya sotsial′nymy systemamy - Problems of formation of national elite. Theory and Practice of Social Systems Management 1. - P.82-90. URL: https://www.kpi.kharkov.ua/archive/Scientific_periodics/Tipuss/2012_1/Polov.pdf [in Ukrainian].

[4] Mandzyuk O.A. (2015). Pidhotovka analitykiv informatsiynoyi sfery u vyshchykh navchal′nykh zakladakh: problemy s′ohodennya [Training of information field analysts in higher education institutions:

Modern problems. Training of informative analyst in higher education: modern problems]. Visegrad Journal on Human Rights. 2/2015, 124-130. URL: http://www.vjhr.sk/archive/2015_2/22.pdf [in Ukrainian].

[5] Yelchaninov D.B. (2011) Systemnyy analiz u derzhavnomu upravlinni [System Analysis in Public Administration] / D.B. Yelchaninov // Teoriya ta praktyka derzhavnoho upravlinnya - Theory and Practice of Public Administration – 2011 - Issue 3 (34). - P. 27-36. URL: http://www.kbuapa.kharkov.ua/e-book/db/2011-1/doc/1/04.pdf [in Ukrainian].

[6] Ministerstva osvity i nauky (2018). Standart vyshchoyi osvity Ukrayiny za spetsial′nistyu «Systemnyy analiz» dlya pershoho (bakalavrs′koho) rivnya vyshchoyi osvity zatverdzhenyy i vvedenyy v diyu nakazom № 1245 vid 13 lystopada 2018 roku [The Higher Education Standard of Ukraine, majoring in System Analysis, for the first (bachelor) level of higher education was approved and implemented by Order of the Ministry of Education and Science №1245 as of November 13, 2018]. URL: https://osvita.ua/consultations/spec-bach/62872/ [in Ukrainian].

[7] Future Work Skills 2020 Report [SR-1382A] // Institute for the Future [Official Website]. URL: http://www.iftf.org/uploads/media/SR-1382A_UPRI_ future_work_skills_sm.pdf

[8] Ivanova A. D, Barmina O.V. (2017) Analiz lichnostnykh i professional'nykh trebovaniy, pred"yavlyayemykh k podgotovke sistemnogo analitika [Analysis of personal and professional requirements for system analyst training] // Nauchnoye obozreniye. Pedagogicheskiye nauki. – 2017. – № 2. – S. 54-59 - Scientific Review. Pedagogical Sciences. - №2. - P. 54-59. URL: https://science-pedagogy.ru/ru/article/view?id=1596 [in Russian].

[9] Kurnosov Yu.V. (2017) Filosofiya Analitiki [Analytic's philosophy]. - M.: Rhythm. - 320 p. URL: https://www.litres.ru/uriy-vasilevich-kurnosov/filosofiya-analitiki/chitat-onlayn/ [in Russian].

[10] Frederick S. Pardee RAND Graduate School. (2018) [Official Website]. URL: https://www.prgs.edu/.

СИСТЕМНИЙ АНАЛІЗ В ТРАНСПОРТНІЙ ІНФРАСТРУКТУРІ

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В статті розглянуто систему підготовки аналітиків та запропоновано аналітичну структуру транспортно-дорожнього комплексу з відповідними аналітичними центрами в кожному з регіонів країни, що мають принципову новизну дослідження за раціональними формами і методами інформаційно-аналітичної діяльності для поліпшення управління інфраструктурними проєктами і програмами та є перспективою створення галузевої аналітичної еліти.

Об'єкт дослідження – система підготовки аналітиків за спеціалізацією «Системний аналіз в транспортній інфраструктурі» для транспортно-дорожнього комплексу країни.

Мета роботи – визначення основних програмних цілей прикладного системного аналізу в транспортній інфраструктурі та стратегічних напрямів створення аналітичної еліти транспортно-дорожнього комплексу країни.

Метод дослідження – системний, концептуальний та програмній підходи.

Запропонована галузева аналітична структура має принципову новизну щодо підготовки системних аналітиків, забезпечення ними транспортно-дорожнього комплексу країни, постійного моніторингу стану та експертної оцінки владних рішень, розробки альтернативних інфраструктурних

проєктів і програм в суміжних галузях транспорту та дорожнього господарства, що дозволяє якісно поліпшити прийняття рішень на стратегічному, тактичному та оперативному рівнях управління інфраструктурними проєктами.

Підтримка з боку зацікавлених сторін (стейкхолдерів) Мінінфраструктури та Міносвіти щодо гарантованого щорічного державного замовлення заявленої спеціалізації «Системний аналіз в транспортній інфраструктурі» у Національному транспортному університеті дозволить значно посилити аналітичний потенціал транспортно-дорожнього комплексу та країни в цілому.

Подальший розвиток об'єкта дослідження – державна підтримка системи підготовки аналітиків для транспортно-дорожнього комплексу країни та запропонована аналітична система є базою для розвитку суміжних галузей транспорту та дорожнього господарства і підтримки громадських ініціатив в справі вдосконалення управління інфраструктурними проєктами і програмами та створення галузевої аналітичної еліти.

Ключові слова: системний аналіз, інфраструктура транспорту, транспортно-дорожній комплекс, галузевий аналітичний центр, аналітична еліта.

Перелік посилань

[1] Нова дорожня стратегія 2020: як уряд планує «зшивати» дорогами всю країну. URL: https://www.epravda.com.ua/publications/2020/01/27/656329/.

[2] Сурмін Ю.П. Аналітика державного управління: сутність і тенденції розвитку / Ю.П. Сурмін // Інститут проблем держуправління та місцевого самоврядування НАДУ. – 21с. URL: http://academy.gov.ua/ej/ej5/txts/06sypdsv.htm.

[3] Половенко Л.П. Аналітична компетентність - ключовий складник професійної компетентності майбутніх фахівців з економічної кібернетики / Л.П. Половенко // Проблеми формування національної еліти. Теорія і практика управління соціальними системами 1‘2012. – С.82-90. URL: https://www.kpi.kharkov.ua/archive/Наукова_періодика/Tipuss/2012_1/Polov.pdf.

[4] Мандзюк О.А. (2015). Підготовка аналітиків інформаційної сфери у вищих навчальних закладах: проблеми сьогодення. [Training of informative analyst in higher education: modern problems]. Visegrad Journal on Human Rights. 2/2015, 124-130. URL: http://www.vjhr.sk/archive/2015_2/22.pdf.

[5] Єльчанінов Д.Б. Системний аналіз у державному управлінні / Д.Б. Єльчанінов // Теорія та практика державного управління. - 2011. - Вип. 3 (34). - С. 27-36. URL: http://www.kbuapa.kharkov.ua/e-book/db/2011-1/doc/1/04.pdf.

[6] Стандарт вищої освіти України за спеціальністю «Системний аналіз» для першого (бакалаврського) рівня вищої освіти затверджений і введений в дію наказом Міністерства освіти і науки № 1245 від 13 листопада 2018 року. URL: https://osvita.ua/consultations/spec-bach/62872/.

[7] Future Work Skills 2020 Report [SR- 1382A] // Institute for the Future [Official Website]. URL: http://www.iftf.org/ uploads/media/SR-1382A_UPRI_ future_work_skills_sm.pdf.

[8] Иванова А.Д., Бармина О.В. Анализ личностных и профессиональных требований, предъявляемых к подготовке системного аналитика // Научное обозрение. Педагогические науки. – 2017. – № 2. – С. 54-59. URL: https://science-pedagogy.ru/ru/article/view?id=1596.

[9] Курносов Ю.В. Философия Аналитики. - М.: Ритм, 2017. — 320 с. URL: https://www.litres.ru/uriy-vasilevich-kurnosov/filosofiya-analitiki/chitat-onlayn/.

[10] Frederick S. Pardee RAND Graduate School. [Official Website]. URL: https://www.prgs.edu/.