ABSTRACTS

UDC 004.9

Dynamic planning model of quality improvement of software development process/ M. D. Godlevsky, E. U. Rubin, A. A. Goloskokova // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 3–6. – Bibliogr.: 7. – ISSN 2079-0023.

The task of quality improvement planning of the software development process is presented in the form of the problem of rolling scheduling, which involves the formation of static and dynamic models. There have been proposed the dynamic problem statement, which is based on the formalization of maturity model. The utility functions of the extent of achieving the target profile and resource provision, necessary to accomplish the goal were used as criteria. Resource provision is determined by two generalized indicators. The first is finance, which are distributed among the individual structural components (practice and focus areas) of the software development process. The second - a resource indicator, is associated with the time the company employees must spend on advancing the software development process to a higher maturity level, that is, the time the employees are distracted from the company's core activities. The solution of the dynamic problem allows to determine the target profile for the static problem statement.

Keywords: quality, maturity model, utility function, goal-oriented profile, dynamic model.

UDC 681.518:658.512

Methods and tools for dynamic requirements catalog management in agile software development / M. V. Tkachuk, R. A. Gamzaev, I. O. Martinkus, S. D. Ianushkevych // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 7–13. – Bibliogr.: 7. – ISSN 2079-0023.

A method for managing dynamic requirements catalog in agile software development, especially on example of Scrum-methodology is proposed. Popular approaches to solving this problem are reviewed. The proposed approach is based on the combined usage of the latent semantic analysis and analytical hierarchy process, it allows to evaluate the given textual software specification with respect to their possible redundancy and possible logical conflicts. Besides that this approach supports the decision making procedure to prioritize the requirements taking into account their functionality importance for target software product. The effectiveness of the proposed method was tested on the test case.

Keywords: Agile, latent semantic analysis, dynamic catalog of requirements analytic hierarchy process.

UDC 004.822

A logical and linguistic model for identification of collocation similarity / S. V. Petrasova, N. F. Khairova // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 14–17. – Bibliogr.: 7. – ISSN 2079-0023.

A logical and linguistic model for identification of collocation similarity has been proposed. The method of component analysis is proposed to determine the binary semantic correlation of equivalence between collocates. The model formalizes semantic equivalence of collocations by means of semantic and grammatical characteristics of the main and dependent collocates in substantive, adjective and verb collocations. The set of semantic and grammatical characteristics of collocates is identified by means of algebra of predicates. This logical and linguistic model is designed to increase the efficiency of semantic text processing by taking into account both syntactic and semantic information of lexical units.

Keywords: collocation similarity, component analysis, semantic equivalence, collocate, semantic and grammatical characteristics, algebra of predicates, semantic text processing.

UDC 519.235

Relation showing between the nominal signs / O. M, Bezmenova, I. P. Gamayun, M. I. Bezmenov // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 18–24. – Bibliogr.: 7. – ISSN 2079-0023.

The problem of estimating the degree of relationship between the parameters measured in the nominal scale is being examined. Indexes of relationship which are based on maximization of correct prediction probability of parameter value by value of another parameter is proposed. Indexes with elliptical dependence and indexes oriented on linear dependence on the probabilities of the individual values are created. Coupling coefficients which are based on the proposed indexes are formed. Estimation of suggested indexes of relationship based on the principle of maximum likelihood is received. The conclusions about the possibility of using the proposed indexes for solution of parameter grouping and object classification problems are made.

Keywords: degree of relationship, parameter, naming scale, index of relationship, coupling coefficient, linear relationship, elliptical dependence, principle of maximum likelihood.

UDC 681.5

Structural and parametric synthesis of the stabilization system of the quasi-static technological process / A. S. Kutsenko, S. V. Kovalenko, V. I. Tovagnyansky // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 42 (948). – P. 25–28. – Bibliogr.: 7. – ISSN 2079-0023.

One of the possible approaches to the synthesis of regulator of the state of the technological process, which mathematical model is presented in the form of transcendental equations linking the inputs and outputs of the technological process is offered in the article. The objective of the research is the adaptation the methods of modern control theory to the quasi-static processes, given by the static mathematical models. The case of a linear relationship "input-output" and quadratic criterion of the quality of the process of state stabilization of the technological process is examined in detail. The advantages and disadvantages of quasi-static mathematical models of controlled processes are analyzed.

Keywords: technological process, stability, linear-quadratic problem, quasi-static mathematical model, control theory.

UDC 629.423.3

Power flow control in electric traction drive powered by the contact network and inertial energy storage devices / V. P. Severin, L. V. Overyanova, O. V. Omelyanenko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 29–32. – Bibliogr.: 4. – ISSN 2079-0023.

A commuter train with asynchronous traction engines and on-board energy storage devices is considered. Electromechanical flywheel storage with inverted DC machine and a solid-state switch was used as an energy storage unit. A scheme of a train traction aggregator was proposed. This scheme includes main parts, such as rotary-field motor and storage device, and solid-state devices - traction inverter and DC-DC chopper. Work of the scheme powered without trolley system was considered. Mathematical models of the energy exchange between traction engine and storage device were created. The results of numerical modeling which allow to estimate the energy efficiency of the system were received. Power flow-over controlling system in the traction mechanism (with storage device) powered by the trolley line was proposed for energy efficiency indexes increase. Controlling system strategy that is in providing compensation for excess or shortage of power of traction inverter by energy storage current management was demonstrated. Controlling system of the power flow that was proposed allows to restore energy into storage device until the full stop of the train.

Keywords: commuter train, asynchronous motors, inertial energy storage, traction inverter, DC-DC converter, control system.

UDC 621.384.6

Using the decreasing magnetic field of the solenoid to control parameters of the electron beam formed by magnetron gun / O. S. Mazmanishvili, M. G. Reshetnyak, G. Y. Sydorenko, I. O. Chertyshchev // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 33–37. – Bibliogr.: 6. – ISSN 2079-0023.

The results of researches and simulations on the formation and management of the radial electron beam magnetron gun with secondary-emission cathode in the electron energy range 35...65 *keV* and measure its parameters during transport in the total falling magnetic field of the solenoid and the control field of the magnet are presented. The results of numerical simulations, the movement of the tubular electron beam are given. It is shown that for the chosen initial conditions for the electron beam and the distribution of the longitudinal magnetic field along the axis of the gun and the transport channel is the electron current reaches the vertical section with a length of the order of a centimeter. The possibility of adjusting the beam hit the place on a vertical wall with the variation of the amplitude of the control of the magnetic field is shown. The present paper describes the experimental and theoretical data on radial electron beam formation by a magnetron gun with a secondary-emission cathode. The initial conditions for the particle flux, which meet the experimental conditions, as well as the conditions of radial current registration, have been formulated. The numerical simulation data are presented on the tubular electron flux motion. The simulation data are in satisfactory agreement with the experimental results.

Keywords: electronic bunch, magnetron gun, magnetic field, numeral design of electronic stream, management of radial electronic bunch.

UDC 621.3.078.001

Parametric synthesis of digital systems targeting tank anti-aircraft gun / T. Ye. Aleksandrova // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 37–40. – Bibliogr.: 4. – ISSN 2079-0023.

The problem of finding the values of the variable parameters of the systems targeting tank anti-aircraft gun of the closed type, in which the anti-aircraft machine gun is mounted on a rotating commander's cupola, and pointing guns at air and ground targets is carried out from the commander's turret with the remote guidance associated with the electric pulse regulation. It is shown that the quality of the estimated accuracy of the systems targeting maintain the desired angular velocity of guidance, speed and power consumption for targeting. As variable parameters systems targeting tank anti-aircraft gun selected gear ratio, the repetition period of the control pulses and the parameters determining the value of the duty cycle of the control pulse. It is shown that the gear ratio should be selected on the basis of a compromise between precision targeting tank anti-aircraft gun, performance and power consumption for targeting. The values of the variable parameters, which provide high dynamic properties of closed systems targeting tank anti-aircraft gun high pointing accuracy and low power consumption for targeting are defined.

Keywords: tank anti-aircraft gun, impulse control system, precision, speed, power consumption for targeting.

UDC 004.3'12:621.396.6-027.31:004.3'124

Influence design of electronic equipment at the beginning of regular thermal regime / V. I. Azarenkov, I. M. Majko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 41–47. – Bibliogr.: 17. – ISSN 2079-0023.

The paper presents results of development of methods of calculation temperature fields of planned and existing products, based on the analytical solution of the heat equation for basic shapes. The proposed General expression of the solution of the heat conduction equation for anisotropic solids with volume, plane, line or point heat sources. The method estimates the beginning of regular thermal regime in a body of arbitrary configuration with an internal energy source with a uniform initial temperature distribution. The calculated dependence of the solution of the heat conduction equation with boundary conditions of III kind. Evaluation of the results of calculations on the received image data by comparing them with the results of calculations by analytical dependences with the experimental data on the influence of design of electronic equipment at the beginning of regular thermal regime. It is shown that the results of the study can be extended to the solution of the heat conduction equation for an anisotropic body with internal energy sources.

Keywords: mathematical model, thermal model, thermal field, temperature field, electronics, thermal mode, regular thermal mode.

UDC 519.2+539.1

Algorithm of increasing of order of stationary stochastic Markov field on the flat surface / O. S. Mazmanishvili, G. Y. Sydorenko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 48–51. – Bibliogr.: 6. – ISSN 2079-0023.

The algorithm for generating random two-dimensional object on the plane is used for modeling the movement of vehicles and consideration of other problems, the solution of which is Markov random field of the second order. Algorithm is synthesized for constructing two-dimensional real normal Markov field of the second order any orthogonal cross-sections of which are stationary stochastic Ornstein-Uhlenbeck process. It is shown that the proposed approach allows the synthesis of Markov random fields of higher order. Normal Markov fields of zero, first and second order, realized on the flat surface of two variables, have been modeled. In this article a sequence have been of embedded algorithms for generating random object of normal Markov field synthesized in the second row, any cross section which is orthogonal, are stationary stochastic Ornstein-Uhlenbeck processes, which differential equations are second order or higher. In this article an algorithm describes to increase the order of the random object – normal Markov field, any orthogonal cross sections which are stationary random Ornstein-Uhlenbeck process. Similar statements can be formulated for the fields, which are generated in the amount and in the space of a higher dimension. The reduction in the value of the partial decrements observed smoothing of the generated form field. It is noted that partial decrements additions affect the kind of topography of the generated field.

Keywords: random process, Markov field, two-dimensional object, Ornstein-Uhlenbeck process, generating of random fields.

UDC 629.7

Research of dependence of decision the terminal control problem with the use of information of inertial module / N. E. Khatsko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 52–56. – Bibliogr.: 7. – ISSN 2079-0023.

The article considers functioning of control system and system identification of the state vector in closed circuit. It describes building of trajectory of etalon motion and a set of functions of programmatic control by using the solution method for inverse problems of dynamics. This method also takes into account values of aerodynamic forces that influence an aircraft during its motion. Control functions were analytically synthesized in a closed circuit applying method of leading point pursuit using the information from inertial navigation system containing sensors of known precision. It was found a correlation between terminal precision and specific values of the synthesis parameter (the depth prognosis). The obtained mathematical expressions for calculating positioning error contain: value of generalized accelerometer error, external perturbation value, and value of depth prognosis. It is demonstrated that precision of the state vector in the terminal point depends on the synthesis parameter value. The recommendations on choosing parameter of synthesis were given. They can be useful for design of movement control algorithms in pair with design of information-measuring system.

Keywords: control system, strapdown inertial navigation system, the measurement the error of the state vector measurement, dynamical disturbance, the accuracy of the terminal management.

UDC 330.46

Problem areas determination of demand (supply) in a strong price trend / S. V. Lubenec, E. N. Harcij, E. P. Pavlenko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 57–61. – Bibliogr.: 5. – ISSN 2079-0023.

The methods of the search are proposed the temporary price charts high probability areas (zones) price reversal in the presence of strong market trends, where there is a significant imbalance between supply and demand on the market. As an effective tool for defining such areas is proposed to use a special price in the form of a graphic form correction pinbar that unmasks the working timeframe the price chart hidden areas such as Rally–Base–Rally or Drop–Base–Drop. Further more precise definition of these zones is performed on smaller timeframes. Successful preliminary search of topping bands, as well as the conclusion of the open markets of commercial transactions in achieving their cost, increases the likelihood of success of commercial transactions. The solution of this problem contributes to the profitability of the trade and investment activities in general. Ways of further study examined issues.

Keywords: trade and investment, the demand zone, the zone supply, price trend, trading strategies Price action, pinbar.

UDC 519.7

Parametric identification Solow model of macroeconomic system / O. M. Nazarenko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 62–66. – Bibliogr.: 16. – ISSN 2079-0023.

The problem specification and identification of linear stationary model with unknown inputs. Modeling the unknown inputs carried out according to the principle of the multiplier. The trajectories of the input controls are arranged on the trend and periodic components that can solve differential equations of motion explicitly. Injected controller which includes two control devices that generate the necessary additional constraints on the parameters of the system of differential equations. Parametric identification of unknown coefficients of the model is carried out by methods of econometrics, under certain restrictions on the elements of the matrices. Testing of these algorithms is carried out on the real statistics of macroeconomic dynamics.

Keywords: specification, identification, cyclical process, simulation, prediction, approbation model.

UDC 004.921+004.8

A Unity 3D engine plugin for creating static ecosystem in game environments / M. I. Bezmenov, Y. O. Potapenko, K. O. Dvornik // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 67–71. – Bibliogr.: 6. – ISSN 2079-0023.

Here we report on the researches and development of the static ecosystem plugin to Unity 3D game development platform, also the creation of neural network has been described. It allows for the designer-driven automatic generation of computer game assets based on the two vastly different approaches: procedural and artificial-neural-network-based; with user-defined object to be cloned, area to be populated and placement rules. Both methods have been applied to the problem of photorealistic distribution of stones on the hillside (including demonstration of the common placements mistakes). All the approaches were then evaluated by the panel of the computer gamers. Opinion of some participants of the experiment with the corresponding results were summarized.

Keywords: Unity 3D, game environment, artificial neural networks, procedural generation, computer graphics, 3D modeling, landscape.

UDC 004.822

Cloud development platform of intelligent decision support systems / A. V. Prokhorov, V. P. Prokhorov, A. O. Matiushko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 72–76. – Bibliogr.: 7. – ISSN 2079-0023.

Proposed cloud platform within the PaaS model and SaaS, which provides support for all phases of the development of intelligent decision support systems, adapting them for applications in all subject areas, storage of knowledge bases and data in cloud data centers, providing access to intelligent systems as services remotely via the web interface. Considered scenarios, tasks. The structure of the development platform of intelligent decision support systems is provided. The platform provides relief to development, testing, deployment and maintenance of intelligent systems without investment in infrastructure and software environment; increasing the degree of intellectualization and adapting existing information systems to changes in goals and objectives.

Keywords: intelligent systems, decision support systems, cloud platform, integrated development environment, ontology**.**

UDC 004.4.075

Structural synthesis of the maturity model SPICE Integration / E. E. Rubin, M. D. Godlevskyi, V. S. Barash // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 77–81. – Bibliogr.: 7. – ISSN 2079-0023.

Nowadays lots of IT companies face the plethora of problem on their way to the successful ending of their projects. Even if they have enough time, money and resources (e.g. people, technical equipment, etc.), it is quite challenging for them to deliver their project on time, within budget and with appropriate level of quality. Hence, there have been created several approaches in order to improve quality of processes that are involved into software development. The most popular branch of them is software process improvement (SPI). The main representative of SPI is maturity models such as CMMI and SPICE (ISO/IEC TR 15504).

There has been provided a comparison of them and come up a means of composing a flexible structure of the maturity model SPICE that takes into account drawbacks of existing models. For instance, CMMI does not provide companies with freedom in decision-making – it says to companies what they have to achieve and complete despite their goals, uniqueness of their spheres of expertise and so on. Talking about SPICE, it does not provide companies with road maps to accomplish the best quality of their work that they need to.

Therefore, there have been described approaches of improving quality of software development process that are based on the maturity models and proposed a procedure of structural synthesis of the maturity model SPICE Integration.

Keywords: quality, maturity model, software development process, analysis, structural synthesis.

UDC 658.7 (075.8)

The structure of the coordination of organizational management model geographically dispersed distribution logistics systems / O. S. Kutsenko, I. M. Godlevskyi // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 82–85. – Bibliogr.: 15. – ISSN 2079-0023.

The problem relevance of organizational management of allocated distribution logistics system is shown. The main stages of this task are represented. The main stages are: the logistics network configuration; the formation of members of the supply chain network; the synthesis of variants of hierarchical organizational structure; the optimization of allocated logistics system on the basis of inter-organizational and cross-functional coordination. The basic participants of supply chain implementation are emphasized. They are OEM (Original Equipment Manufactures), 3PL provider (Third Party Logistics Provider), 4PL provider (Fourth Party Logistics Provider), LLP Provider (Lead Logistics Provider), as well as functional units of OEM and LLP. The organizational structure of the three-tier system of supply chain management is considered with concerning the all types of providers. The main tasks solved at every management level are underlined. The control variables used at the related hierarchical levels are suggested.

Keywords: organizational management, logistics, distribution, supply chain, coordination, management three-tier system.

UDC 61:004(043)

Development of decision support system for multi-field medical care / O. O. Sitnikova, M. V. Pochebut // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 86–91. – Bibliogr.: 15. – ISSN 2079-0023.

The given paper considers the basic principles of decision-making support in the system of family medicine. The sources of data for clinical monitoring are described, which include health encounter, health screening, and medical records. The flows of data used for diagnostics and diseases prevention are analyzed in the paper. The main attention is paid to data of medical records such as demographic data, results of examinations, information about diseases and the lists of medical disposals. The classification of features based on the analysis of patient's electronic medical records is suggested. The logical data model for decision support system is represented. It is suggested to formalize knowledge that form the basis of decision-making process of family physician with the help of the theory of intelligence, in particular, via the method of comparator identification. The architecture of the information system of clinical monitoring is developed.

Keywords: decision support system, medical-biological parameters, clinical monitoring, family medicine, identification.

UDC 519.2: 658.5.011

Formation of the plans for the production of electricity, taking into account the dynamics of changes in the state power system / S. V. Shevchenko, A. A. Egoyanc // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 91–96. – Bibliogr.: 8. – ISSN 2079-0023.

In the paper a method of forming plans for the production of electricity, taking into account the dynamics of changes the state of the basic production resources power system. On the basis of the developed mathematical models and algorithms to control the state of the power system are determined of the distribution of units of volume of the generation and supply of electricity, as well work schedules of separate units, ensuring the production of electricity in accordance with the required volume of consumption. The results can be used as part of the tasks of the functional structure of subsystem supervisory control of power system.

Keywords:electricitygrid, changing conditions, criteria, model, optimization, algorithm,analysis.

UDC 519.681

Using the statistical analysis methods in the processing of survey data of population / V. V. Karpenko, R. H. Akhmadov // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 97–101. – Bibliogr.: 6. – ISSN 2079-0023.

A model of the transportation problem of linear programming, in which the demand for the product transported in points of its implementation clearly defined. A method for solving this problem. It is based on complex criteria that take into account the losses arising from the uncertainty of demand, the losses associated with lost profit in the deficit of the goods and transport costs for the carriage of goods. The method implements an iterative procedure consistent improvement plan. Also proposed an alternative two-step method for solving the transport problem, which converts the two-index the original problem to the problem of single index. The resulting vector single index consists of components that are fuzzy numbers. As a solution to the problem adopted a set of numbers that minimizes the possible losses from these factors.

Keywords: transportation problem, linear programming, fuzzy demand, traffic optimization, fuzzy math, transportation planning, minimization of losses from the uncertainty.

UDC 658.506

About the one approach to solving the problem of enterprise business process structure optimization / A. M. Kopp, D. L. Orlovskyi // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 102–108. – Bibliogr.: 7. – ISSN 2079-0023.

The article considers the problem of support of the process of research and analysis of the enterprise business structure, considers the problems of modeling, analysis and optimization of business processes, their place and role in enterprise management. Also there were considered problems of business process modeling, place and role of the business process modeling in the problem of the enterprise analysis, issues related to business process optimization and the main approaches to it performing. To solve the considered problem there were proposed to use simulation tools, different mathematic models and methods. To provide the information support of the considered problem there were developed the database and application that implements specific mathematic and algorithmic support of the considered problem solution.

Keywords: enterprise, business structure, business processes, business process modeling, business process analysis, business process optimization.

UDC 004.942:656.073

Logistic management in heterogeneous transport networks / O. Ye. Fedorovych, N. V. Yeremenko // Bulletin of NTU "KhPI". Series: System analysis, control and information technology. – Kharkiv : NTU "KhPI", 2015. – No. 58 (1167). – P. 109–115. – Bibliogr.: 9. – ISSN 2079-0023.

Formulated and solved an actual scientific and applied task of methods and model building of information technology of cargo management in a products supply and marketing logistics system in geographically dispersed participants in the supply chain, as well as the complex channels of delivery in a heterogeneous transport network. Was developed the method for forming the structure of the supply and marketing chain in diverse transport network, which, unlike the existing ones, takes into account a variety of storage places, distribution centers and transshipment points and is based on the integrated use of cluster analysis, multi-criteria optimization, fuzzy logic and enumeration theory, which improves the efficiency of logistics freight management. A method for calculating the basic characteristics of freight using multiphase simulation model that takes into account the intensity of freight traffic in the distribution centers and the availability of additional transshipment points in a heterogeneous transport network that allows justifying the costs associated with loading and warehousing is offered. Described the model of freight management using fractals and agent-based modeling, the composition (the system organization) and set the control algorithm system. Proposed formation sequence of the control fractal model in which the hierarchy corresponds to the hierarchy of the fractal logistics chain. Formed an architecture of applied information technology of distributed supply chain and marketing logistics management, which consists of the following components: a block of modeling the delivery channels structure; discrete event simulation block; agent-based modeling block.

Keywords: diverse transport network, multimodal freight, transshipment point, warehousing, sales management, fractals, agents, information technology.