KAPITEL 2 / *CHAPTER 2* [2]
METHODS DIGITALIZATION OF INFORMATION INTELLECTUAL TECHNOLOGIES FOR SYMBOLIC MODELING ADAPTIVE BUILDING PROCESSES FUTURE PROJECTS

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Introduction

The further development of modern branches of computerized technologies for public globalized human activity increasingly depends on innovative methods: ensuring computational quality of modeling processes; guaranteed level of management of reliability states; current failure resistance of promising functional materials [23-25] for tools; determination of real conditions of competitiveness and forecast life cycle of viability. Existing traditional information technologies, despite the significant expansion of the Internet, as a social communication and operational management system, no longer meet the needs of future polyergistic production organizations. The desire for optimal tasks for perspective creation through early improvement of concretely assessed conditions of future projects of restored construction does not turn into quickly obtained expedient materials, products, goods, services. The dangerous area of carriers of deviation of the fact from the plan or forecast lies in the fact that all constituent particles change in the space and time of the single space-time continuum of the universe in accordance with the continuous influences of the independent and non-stationary external environment.

Prospective objects of future application can be classified within the flow of complex dynamic systems that respond to the predicted functional effects of heterogeneous factors of the external environment of an undefined full-scale non-stationary environment [1-4]. The results of the action of risky disturbances on the contact surfaces of flow complex dynamic systems cause real deviations of controlled life cycles and target states. Together with the provided means of protection at the level of special promising functional materials [23-25], they form the desired state, as

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guaranteed survivability and functional stability of innovative flow complex dynamic systems. Thus, for the orders of the leading industries, the economy, including "Intelligent Transportation Systems", the use of promising functional materials is urgently needed for adaptive construction and future projects.

The attractive safe area of carriers of future progress is inhibited or otherwise promising functional materials lose the pace of development of safe, smart, ecological, mobile transport, as well as construction processes according to future processes. Therefore, social communications and the Internet should unerringly unite the efforts of intellectuals to intensively search for appropriate evaluation criteria and complex modeling methods to ensure the existence of effective technologies of the future. Only under the conditions of the existence of justified technical and technological solutions for the future indicators of the quality and efficiency of the technology of delivery of engineering tasks of operational modes, all the ordered promising functional materials will not leave the Pareto zone under the circumstances of constructive resistance to disturbances from the external surrounding environment. Before the approach of the next future horizon, there are known problems of the climate change situation, ecologically dangerous areas of the "green" noosphere carriers, energy resource limitations and situations that we are still forecasting, predicting and projecting. Only on already existing hardware and software complexes such as MatLab, MatCad, Mapl, DataManing, etc. Any further improvement is achieved due to the development of new technical and technological solutions and the application of methods of digitalization of information and intellectual technologies for adequate digital calculation operational models, which, together with ISO standards with typical software modules, help the means of computer information technologies to implement explicit processes that we model, according to the models, a safe area of adaptive construction media under future forecasts without risks and emergency events.

2.1. Optimization problem

At each stage of society's development, scientific knowledge determines: preliminary constructive steps of the future; evaluation of advantages and disadvantages of technical and technological solutions; alternative possibilities of further systematic optimization of the modes of operation of multi-energy production organizations with new energetically mobile engines [5-9] and innovative means of guaranteed adaptive management of future management objects for the needs of globalization.

The current conditions of functioning of various branches of social activity of multi-functional production organizations and integrated systems of Ukraine are related to the special state of military operations, which directly affect the implementation of life cycles of processes according to daily schedules throughout the hierarchical structure of state administration. The application of computer information technologies in the market conditions of Internet telecommunications, unlike the previous peaceful years, priorities are now changing and new orders are being formed with the acceleration of the optimal distribution of available resources for early maintenance of the action of special multi-energy production organizations.

Limitations always arise when increasing the forecast forecast interval (for example, 2024, 2025-2030, 2050) and the step of making management decisions. For example, in global forms of life on the planet, the financing of actions to protect against future risks with the coincidence of undesirable circumstances reveals the increasing complexity of threats and the scale of spending resources to protect against adversity. Therefore, overcoming the real complexity of risks and uncertainty is possible thanks to the hierarchical self-organization of social communication. It is really necessary to build effective conceptual interface infological models for the heterogeneous use of existing hardware and software complexes and additional specialized new models and methods. Strategic achievements in the field of automating the performance of desired functions and tasks of production and organizational management in promising multi-level structures of innovative flow complex dynamic systems where technical and

technological solutions will arise on the basis of scientific knowledge. Achieving the expected values of the ordered properties, which guarantee the creation of new objects, in the planned terms symbolically optimizes the full significant expenditure of resources on the principles of self-learning and Agile [1-6] and therefore is definitely relevant.

The author's idea of an effective object regarding the topic of research into the processes of creating innovative materials consists in the trinity of informational relations when solving complex (problematic-non-trivial) problems. They belong to: the single metrological subsystem of parameter measurement [1, 12, 17]; specialized symbolic-digital subsystem of complex modeling; to the hybrid energy subsystem of testing technical and technological solutions [2, 10-15] by means of digitization of information and intelligence technologies [16, 20-23].

The integral unity of formalized methods and techniques of computer information technologies is necessary for the processes of conceptual information modeling and the energetic search for effective management technical and technological solutions according to integral security criteria. Informatics clearly does not interfere in the sphere of technology of real production of innovative materials. But all controlled objects that are modeled, for future construction, we simulate without emissions into the atmosphere and thermal threats to life.

2.2. Materials and Methods

Problems of improving the environmental condition of cities of millionaires; are solved if the fundamental problems are actively solved: the construction of energy mobile engines for various vehicles of energy mobile engines; restoration of soil fertility for the development of agricultural production of plant products; restoration and development of Ukraine in the special and post-war period. A significant expansion of the natural object correspondingly increases the amount of memory of computer information technologies, where input and output data are accumulated for

energetic modeling procedures [1, 18-20] for the needs of obtaining effective solutions for problem-based research of the future. Therefore, the next stage of building intelligent software and hardware complexes [1, 20-25] directly depends on the methods of digitalization of information and intellectual technologies [23-25], for the symbolic modeling of future complex dynamic systems that will be embedded in a non-stationary external environment.

The problems of strategic management in the future are much more complicated than projects based on computer information technologies and means of project work automation systems [1-4] according to the technical and technological task of building a controlled object. The significant increase in complexity is due to the risks of forecasts and the real uncertainty of the global external environment of the helio-geo-metasystem and the dependent socio-technical noosphere, as a macro flow of complex dynamic systems. Modern international science is still only looking for and formalizing the foundations of building a safe region of carriers of the desired future without already defined dangerous regions of carriers of threats and disaster. The main tools of computer information technologies and automation systems of design work are now unable to overcome the computational complexity of actual modeling objects due to increased productivity of special processors: scenarios of new development of infrastructural climate changes in time and geospace.

The intelligent agent of the system implements complex modeling according to the task and technical and technological solutions. We will recall the formal definition of the concept of an actual "task":

$$\theta = < \varsigma, Z, F, \delta >, \quad (1)$$

where: θ - a modern topic or the initial informational object of the problem system within the problematic challenges of society;

ς - a list of targets in the form of a set of instructions;

Z - a complex set of states that, in the form Z_0 of initial, intermediate current Z_i and final target Z_n states, already capture the essence, features and specificity of this class of transformations within the microprocessor management actions of software and hardware complexes;

F - a functional complex of production rules, which has already been determined in advance according to the algorithm for solving the problem in the form of a sequence of typical operators, in order to achieve ς_n the goal - the final result;

δ - the initial symbol of the author's idea of an effective object of the problem system for technologies of automatic transition from the initial state to the terminal end with fixing of technical and technological solutions for the needs of energetic modeling.

The author's development of the essence, features and specificity of functions consists in computer information technologies of digitalization of information and intellectual technologies for the software-hardware complex of the complex model of program action proposed by us takes into account the problematic field of activity of polyergic production organizations, including the interpretation of input concepts (sentences), human words, in the form codes-symbols of paradigmatic linguistics of smart intellectual agents of the system and specialists.

The essence of the digitalization of information and intelligence technologies consists in the purposeful transfer of each key concept from the integral portion of the task in the language of command-and-command control to another area of the unified information space of computer information technologies. Symbolic codes continue the language theme of the intelligent agent of the system, where Z and F are further rationally implemented by an automatic program - a dispatcher that controls the module with specialized information procedures. During the guided search, "running" (direct and reverse within the communication interface) can be called discursive (from Latin discursus; English discourse; French discours; German discurs; Italian discorso). The first "discourse on method" ("Discours de la method" in 1637) was defined by R. Descartes. In our automated dialogue, there are actually a couple of cycles: in the neural network IAS $\subset$ PEVO is a real phrasebook; in the digital automata of the digitalization of information and intelligence technologies of the dispatcher who controls the module and recognizes the significance of the indicated.

The unified information space and the specified functions Z and F in the specifically described conditions of the modeling task provide an algorithmic flow

according to pre-verified rules, principles, models, methods and means of multi-level structures of digitization of information and intelligence technologies. The internal hidden, or implicit but rational (ratio intellectus is almost optimal according to local criteria according to the signs of silencing by the intelligence of a specific dispatcher controlling the module) form is implemented in the entire software and hardware complex of digitization of information and intelligence technologies according to the use of a special N meaningful task.

The indicators of the proposed automation methods depend not only on the awareness of a specific intellectual agent of the system - the user, the author of the author's idea of an effective object, as well as on the accumulated resources of software and hardware complexes. The accumulation of knowledge and the ability to use one's own internal and external "cloud" resources of the integrated environment of the informatized noosphere is achieved only by the basic symbolic concepts of digitization of information and intelligence technologies. The practice of applying the proposed principles of discourse in innovative CITs contributes to the further development of mathematized knowledge in works with the simultaneous integrated effect of self-organization of society. The symbols take into account the properly made property in the form of the experience of individuals who are able to generate their own author's ideas of an effective object. The description of the experience of the intelligent agent of the system in the linguistic pragmatics of interaction with the digitalization of information-intelligent technologies contributes to the development of functional semiotics of future projects. Accumulated symbolic knowledge characterizes the integrative actions of digitization of information and intellectual technologies in various environments, situations, and phenomena that change according to human activity within production and organizational spheres. It is possible to successfully formalize global problems together with significantly complicated actual tasks of practice according to the meta-symbolism "Target-problem-means of technical-technological solutions". It is the ratio intellectus in the form of a conscious mentality (mens – the mind of the intellectual agent of the system and at the same time spiritis the life force with the help of the digitization of information and intellectual

technologies of the accelerator) that ensures the effective reality of the effective object defined in the form of the author's idea. Coded descriptions of further causal steps with a situationally optimal choice of effective resources, means and methods of action (according to possible changes in criteria according to innovative value systems) begin to dominate over "outdated - previous technical and technological solutions". The search for effective phases or attempts to reduce the problem, for example, climatically dangerous areas of threat carriers from risks and dangers of the external environment, has not yet been completed with significant comprehensive success.

The specific automated discourse of semiotic activity in the processes of ergistic modeling of objects of practice should be defined as a complex communicative method of self-organization of a pair of a natural intellectual agent of the system and an artificial digitized intelligence. In this dialogical process of mutual self-organization of participants at all hierarchical levels of production and organizational activity, the embedding of equivalent concepts-structural fragments takes place. The most progressive phase of digitization of information and intelligence technologies is the formation of new concepts of the future metalanguage for the next, as yet undefined horizons of the development of the information society of the future. The logic of the life cycle, which in turn changes according to innovative objects.

In this way, the scientific discourse has moved on from the traditional expert analysis of relationships in each individual description of a local fact to complex heterogeneous relationships on longer spatial and temporal continuums, which together determine the unity of the universe, integrity, interdependence of development, both of flow complex dynamic systems, and the external environment in the multiple universe of existence of the universe.

The proposed models, methods, and means of digitalization of information-intelligent technologies for the construction of software-hardware complexes of computer information technologies not only illustrate the rules and principles of direct and reverse dynamic relationships between the natural intellectual agent of the system (analog-linguistic) mind and the artificial result of the functioning of polyergic production organizations, as a product in the form of jointly formalized technical and

technological solutions. It is actually the innovative reporting form of technical and technological solutions that expands future horizons. The meaning of the digital symbolic fixation of relationships is the priority of significance in problematic Big Data of the key role of the innovative part of the author's idea of an effective object (a scientific step towards novelty with evidence of truth). Well-known classic documents have many objections, limitations, statements of the impossibility of solving problems, which is especially relevant for the information society as a whole. The meaningful meaning obtained in the discourse is the explanation of the rational route to the future with the use of real resources according to the defined Plan document (only one stage of Agile principles). Everyone knows the difference $\Delta(t) = |route\ (Plan - Fact)| = \varepsilon$, $\forall|\varepsilon| \gg 0$ fixing the real discrepancy in the area of specific goals.

For millennia, a real flight, movement along a route (even precisely according to geodetic measurements of waypoints) differs in terms of the actual expenditure of resources and the obtained effects, profits or, on the contrary, situational troubles. Such pragmatics (deviations and real fluctuations whether local or in general) have never replaced the efforts of forecasting, prediction, modeling and forward-looking planning (programming by means of computer information technologies). At the same time, parallel organizational actions were developed to ensure functional stability (special multi-criteria management laws in special cases of threatening deviations due to the dangerous area of carriers of actual influences of the external environment).

The description of mathematical problems, which supports the digitization of information and intelligence technologies after the introduction of a linguistic task, requires an explicit digitized definition of the following components:

- phase variables during each nth modeling process;

- control vector and tuple of externally controlled parameters of the dangerous area of the media of influence of the external environment;

- equations (symbolic, algebraic and logical) of the process that we model or synthesize by means of digitization of information and intelligence technologies;

- restrictions, conditions, available resources and reserves of the border of the safe and dangerous area of carriers;

- optimization target function (convolution of many criteria);

- working parameters that we monitor, evaluate, manage to obtain the final multi-parametric result;

- external emergency assistance in critical circumstances of the operation of software and hardware complexes.

The user of the system of digitalization of information-intelligent technologies of the complex model of program action when forming working models (archive, calculation-base, synthesis models of regimes) performs the following typical operations: building an operational model of the object based on external or internal system information; adaptation of working models to factors influencing the external environment; synthesis of computational operational models with possible further adaptation to the conditions of the space-time continuum. Part of the information is automatically copied and compiled by the core of the complex model of program action according to pre-agreed levels of information support. We compile other Big Data using the directive-program management language. A separate individual adjustment on each of the specified fragments acquires qualitative values for the formation of the target working operational model according to the task. External data have protocols and structure of input formats. These are internal programs with system-binary interaction, including the "Cloud" mode for communication with remote other intelligent agents of the system.

The stage of initial construction of the archival model for specific topics is the most important for ensuring the effectiveness of the method of automating the performance of these functions and tasks. In this way, we decide the method's focus on the main organizational issues: the composition of the M. QI model. S; number and composition of the M.RJ.S model; principles of presentation of ER schemes; equivalence-substitution and coding of information by eight types of associative groups [1, 7, 19]. The initial machine processing allows you to populate the archive database in parallel or earlier than the finished formatting of the knowledge base. In one session, the intelligent agent of the system manages the processing of any number of portions of defining data. The volume of the field of automation is equal to the

amount that, as the carriers of the process formats of the components are ready, entered the memory of the arrays of software and hardware complexes of the complex model of program action. The construction of the archive is carried out in accordance with the following sequence of control system tasks, which make up typical automatic functions, as well as group unified tasks for the dispatcher who controls the digitization module of information and intelligent technologies.

The principles of the structural structure of the language of the complex model of program action are similar for all forms of the method of automating the performance of functions and tasks of managing processes that create algorithmic technological electronic maps. They are effective for expedient replication of GRID interactions between AI robots. In the most complete discourse, the intelligent agents of the system discuss actions and directives, but concisely implement the input of tasks. Similarly, we define instrumentally abstract organizational classes using the method of object-oriented programming.

2.3. Results

For example, the process of synthesis of computational operational models can be described in the form of the following software task.

1. D. Organization issuance of archival information on request unified system code orders

2. (M.RJ-S) – an identifier with a model name

3. H. (Only)/(apart from)/(District) - order is a tuple of a specific fragment.

4. Item number list, if required.

5. Repeat clauses 2-4, as necessary.

6. End of the directive (D) for the dispatcher of the system control module.

Similar typing is implemented by means of Java, Delphi, C# and other designer

tools. Transformation of the directive task regarding the formation in the memory of software and hardware complexes of a complex model of program action, a working model into clear functions for calculations or its construction on the basis of archival information of RBM. The developed automation method provides a concise algorithmic technological electronic map of the following composition.

1. D. Synthesis of the model scheme from the archive of working basic modules

*2. (M.RJ.S) and (**ROM*) – the name of the synthesized model.*

3. H. (Only)/(apart from)/(District) /((Инои) – predictive labels

4. (M.RJ.S) – identifier with the name of the model, more understandable to the intelligent agent of the system

*5. (**CWR*) P, V, T, C* - Information type coded symbols*

*6. List of the corresponding given **CWK**

7. Repeat clauses 3-6, as necessary.

8. End of the directive (D) for the dispatcher of the system control module.

Language-friendly toolkit and clear technology of the method for implementation of functional ergistic modeling is aimed at speeding up the set of software actions according to the OSI standard.

Analogous procedures of a complex model of program action - "library of connectors" and synthesis of working models form an integrated scheme of specific digitalization of information and intelligence technologies.

In addition to synthesis operations at the stages of project automation systems, the proposed automation method takes into account future industrial technological processes, for example, functions of grinding, mixing, compression, development of the reaction product. These future stages of functions require knowledge of controlled variations for situational variables P, V, T, C that depend on t and θ^0 temperatures. The composition and final product depends on the presence or absence of any impurities. The expert - the intelligent agent of the system receives all these data quickly without delays in the form of basic calculation and operational models supported by computer

information technologies and means of digitalization of information and intelligence technologies.

Table 1. Advantages of the introduction of digitization of information and intelligence technologies into software and hardware complexes of a complex model of program action

The effect of the implementation of a complex model of program action	
Direct	***Indirect***
1. Reduction of labor intensity of the accounting process (elimination of duplicative input of information; formation of a single database); 2. Reduction of the number of support staff for maintenance of the storage in the current state. 3. Economy of material resources that are not spent during simulation modeling and substantiation of the effects of corporate multi-agent self-organization of synergistic digitization of information-intelligent technologies.	1. Access to data in real-time mode and procedures of automated task functions for forming new composite models; 2. Reduction of working time costs associated with redundant search of document flow (increasing labor productivity: effective use of working time and performance of a qualitatively greater volume of work) of various intelligent transport systems; 3. Operational data flow control; 4. Auto-control of information; 5. Increasing the level of professional training of auxiliary personnel (material scientists of intelligent transport systems).

The implementation of a complex model of program action is designed to satisfy the need for complete and timely information on the formation of new managed objects and their guaranteed management, in order to ensure safety by means of computer information technologies, as well as sufficient speed of performing complex tasks, functions and operations. The advantages of the implementation of digitization of information and intelligence technologies, which include methodically organized, purposeful, continuous control of quality, efficiency, reliability, effectiveness of the

proposed set of methods of symbolic digitization of the performance of functions and tasks of industrial and organizational language management. For example, thermodynamic processes of creating promising functional materials with the help of linguistic and semiotic innovative means of software and hardware complexes of a complex model of program action.

According to the principles of the OSI/IEC standards, which regulate the future development of computer information technologies in the form of large-scale implementation of digitalization of information-intelligent technologies and software-hardware complexes of various fields of human activity, the system-forming mechanisms of the digitalization apparatus in relation to the linguistic attributes of pragmatics and semantics are defined in the previous subsections by topic , ontologies, grammars for future projects and tasks. We have interesting results from the thermodynamic process of creating progressive (future) materials for EMV class engines for the needs and tasks of intelligent transport systems. The specified hierarchical nesting of heterogeneous components of digitalization of information and intelligence technologies does not limit the further development of computer information technologies for further intellectual scientific knowledge.

2.4. Discussion

The proposed means of digitization of information and intelligent technologies also meet the latest *(next+1)* criteria for the future functioning of intelligent transport systems. Attention to future climatic and industrial thermodynamic phenomena in an independent external environment requires descriptions of natural fluctuations and impulse changes of each heterogeneous influence. Predictive prediction of the three-dimensional temperature field based on global trends on a planetary scale can practically be completed by the following three consequent estimates S(t,x,y,z,u) of the generalized future state.

$$S_{i+1} = \begin{cases} 1 - true, reliable, does\ not\ contradict\ the\ logic\ of\ the\ state; \\ \sim - uncertain, there\ are\ contradictions, partial\ conflict; \\ 0 - definitely\ does\ not\ change\ anything\ because\ it\ is\ false \end{cases} \quad (2)$$

$\forall S_{i+1} \in S(t, x, y, z, u)$- an element of the next state of streaming complex dynamic systems, which continues future development and meets all OSI/IEC criteria and standards.

Linguistic semantic integrations (2) can be interpreted for the local PCC S as simultaneous circumstances of 3D states of flow complex dynamic systems according to the key rules:

IF {1} THEN [normal, normal, positive, action/movement media safe area const];

IF {~} THEN [freelance, unwanted, variable, var ACT actions/movements];

IF {0} THEN [opposites, inverses, negatives of the dangerous region of action/movement carriers]. (3)

Both (2) and (3) formalizations of logical statements of the intellectual agent of the system at different hierarchical levels characterize one single S object, but from different sides of knowledge of real trends or options for social actions within the limits of risks and uncertainties of factors of the external environment.

Social generalized standardized knowledge can be considered objective or metalanguage, which according to long experience does not contradict practice. We enter the metaimplication symbol "⟹" in the form of a double arrow in the direction. The expression of symbolic description $P_i \Rightarrow C_j$ can be simultaneously interpreted as "if the premise P_i or reason is logically true, then the conclusion or consequence C_j is also true." Therefore, it is customary to call such relations between causes and consequences a clause [4-6]. A clause is a meta-description with fixation using the symbol " ⟹ " of the order relation under the conditions of the method of equivalence of pairs of different descriptions on the left and right relative to the indicator. Logic establishes the following three laws for sets A, B, C. Reflectivity $A \Rightarrow A$; Antisymmetries if $A \Rightarrow B$, then $\overline{B} \Rightarrow \overline{A}$; Transitivity if $A \Rightarrow B$ and $B \Rightarrow C$, then $A \Rightarrow C$.

In cases of symmetry, the laws have a unified description "if A=B, then B=A".

The logic of digitalization of information-intelligent technologies of statements, for which there is a connection between cause and effect, is interpreted as an extension of Boolean logic [6-10]. The automatism of the transition from the identity of Boolean to the truth of the clauses of digitization of information and intelligent technologies, which we simulate by means of a complex model of program action, consists in the knowledge of an independent system of axioms of Boolean logic. There are four known laws with the following names: commutative, associativity, distributive, zero and one. The key is an elementary reference equivalent statement in binarized form. It is always needed when situationally all complex linguistic statements of the intelligent agent of the system can be classified and recognized with the help of already defined logical predicates. The methods of equivalent digital codes-operands, the use of substitution lead very quickly, flexibly and precisely to the goal. For example (clause Big Data is identically true) $A \Longrightarrow B \rightarrow A$, as it is classically performed on descriptions of linguistic clauses.

Please note that the implication symbol "→" in the logical conclusion (proof) of a complex model of program action characterizes ∃ only the subjective assessment of a group of competent and authorized experts. But their opinion does not always coincide with the objective ∀ opinion due to the areas of existence (for one case - ∃≠ for all and every ∀ quantifiers) of subsets in the universal extended set, as visualized by Venn diagrams [11].

In cases of heterogeneous plural linguistic description, cause-and-effect relationships are objectively described by the already digitized information-intelligent technology of the clause.

$$P_1, P_2, \dots, P_i, P_{i+1}, \dots, P_n \Rightarrow C_1; C_2; \dots; C_j; \dots C_m, \qquad (4)$$

where: the fractional forms of the left and right fractions are called Hornov definitions. It is possible to make such descriptions according to the rules of substitutions in modern software and hardware complexes such as MatCAD, MATLAB, DataMinimg, or where the programming library contains tools of logical languages such as Prolog [9,11].

Directive-command principles of a concise expression with an explicit default of

previous content. Therefore, the use of relations $R_i(ME, TCC)$, $R_i(MI, BC)$, $R_i(TCC, BC)$ within the framework of a fragment of the conceptual base is proposed to be restored and revealed by means of digitization of information and intelligence technologies. The situationally required voluminous descriptions of the complex model of the program action are specified due to explicit (by *S-,P-,R-,M-* and A-signs) connections in the chain of generalized identifiers of computer information technology objects that we model and forecast.

Disclosure of internal relations is done using $R_0(MA, COC)$, $R_0(MI, AC)$, $R_0(COC, AC)$. This allows you to answer all unified tuples, where questions are related to the features of the component materials of a complex system.

The transition from an abstract code relation $R(X \to B) = R(X, B)$ to a complex model of program action specifying it with concrete relations is carried out by the application of A-marks. The analysis of the bush of the concept X for all relations associated with the concept of relations of the search object Y allows, if necessary, to automatically form an association. With its help, we will make the transition from ME_i and ME_j concepts to fragments or to their elements. If a hint association is formed, then a quick and accelerated search is possible using arrows with relations *R(ME)*, *R(MA)*, *R(MI)*, *R(TCC)*, *R(COC)* linguistic or code names of the properties of the corresponding S object. If an association is formed by contiguity, then when searching, we use pairs of relationships $R_i(TCC, BC) - R_j(MI, BC)$ or $R_0(COC, AC) - R_0(MI, AC)$ depending on the external or internal type of description of the manifestation of real properties.

Conclusions

In the digitization of information and intelligence technologies, the unified processing actions of typical software modules are implemented automatically with the participation of similar symbolic transformations and numerical multi-criteria solutions in accordance with the language task of the system's intelligent agent.

Advantages and differences of digitization of information and intelligence technologies are characterized by the following essences, features, specificity and functionality.

1. The linguistic dialogue between the intelligent agent of the system and the user of the digitization of information and intelligence technologies is automatically completed, and only the binarized equivalent form of the digital compressed code is used.

2. Full-scale processing of input information in the environment of digitization of information-intelligent technologies realizes the ability to store, transfer, transform or combine new structures with symbolic binarized models multiple times without spending resources of computer information technologies by other users.

3. A similar essence of a complete object is provided at all levels of the hierarchy of the intellectual performer without losing complete awareness of the area of multiple application.

4. The symbol-code characteristic of the components of flow complex dynamic systems excludes errors, mistakes, failures, looping due to the linguistic diversity of the functionality of the spatio-temporal situational relationships of interpretations for the needs of broadcasts, simulations, emulations, compilations, restoration of guaranteed-adaptive control processes.

5. We accumulate in the memory arrays spatio-temporal situational awareness regarding the shortcomings of the determinants, practice ensures the digitalization of information and intelligence technologies, to model a new future for the further development of life in the noosphere.