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The stability-saving process of the cooperative behavior of autonomous agents` teams in dynamic problematic spheres of the digital economy

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Abstract
The article is focused on stability-saving problems of the digital economy as socio-cognitive mechanism. It is determined by the autonomous agents` teams in intellectual mobility realization in conditions of information "noise" and other external factors. The authors suggest creating the configuration of the basic characteristics of a complex of systems for monitoring and managing the formation of individual and group cognitive-reflective models. It is made to identify and interpret the reasons of agents` behavior that is realized through the information networks. Identifying the weak spots of it allows us to make management decisions, to plan the measures of the interactive communication, establish the feedback and take corrective steps as a tool for constructing of the future.

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Some associations of information-cognitive consumers (collectives of autonomous agents) form the organizational and functional framework of the corresponding complex network systems. Investigation of the properties of these associations forms a set of characteristics of aggregated personality-cognitive clusters as part of a kind of personal-cognitive supersystem of the digital economy.

The complexity of solving this problem lies in its multifacetedness, since random or initiated malfunctions in just a few directions of imprinting to individuals, of which collectives of agents, stereotypes of behavior based on well-established methods of interpretation of the surrounding reality, can divide a single system for maintaining the effectiveness of intellectual mobility on isolated areas [2; 11]. It is necessary to underline a large amount of information "noise" or direct information attacks, the information affecting the individual is distorted, which requires the development of new concepts using current technical achievements [12]. Including with the focus on overcoming existing barriers (technical, departmental, etc.) for effective joint work of various organizational, technological, etc. structures management [6; 10].

When developing campaigns for the formation of individual and group cognitive-reflexive models for identifying and interpreting what is happening, which serve as a source of action for collectives of autonomous agents as a tool for constructing the future, the authors took into account and used the results of a number of well-known projects, including earlier and last years (Ageev A.I., Lepsky V.E., Lefevr V.A., Rastorguev S.P., Shevrin H., etc.) [1; 4; 5; 11; 14]. Particularly promising in this regard is the Russian concept of creating a multifunctional information monitoring system - a noo-scope, as a platform for prognostication of deep processes and trends and a tool for direct design of the future [3]. Also interesting in a similar work plan is Kaleva Litaru, devoted to his method - Culturomics 2.0 and the GDELT project - the creation of the analytical forecasting platform Destrometer.

Given the considerable probability of temporarily blocking the active participation of collectives of autonomous agents in various forms of intellectual mobility during information attacks on personal-cognitive clusters (for example, the events of September 11, 2001 in the United States that "knocked down" the politico-civilizational setting of the million autonomous agents both in the US and in other

countries of the world) with a large situational component of the uncertainty of the consequences (due to lack of information and for other reasons), the authors suggest iratsya on the controlled fragmentation of the whole personality-cognitive super-digital economy within the framework of stable or unstable structured-en aggregated personality-cognitive clusters (similar to temporary functional neuronal clusters). On this basis, it is proposed to implement the subsequent restoration of the systemic integrity of the structure of social and economic relations determined by the political or other interests of individual autonomous agents within the framework of imprinted methods of identifying the surrounding reality based on configuring ways of communicating information to the consumer.

To create a consolidating collective of autonomous agents, their "convolution" into cluster structures of a lower level than clusters, it is necessary to break up the personality-cognitive supersystem of the digital economy in such a way that each aggregated personality-cognitive cluster is represented as a kind of aggregated information- a cognitive consumer, strongly or loosely related to other aggregated personality-cognitive clusters.

It is necessary to create a package of situational analysis models of the installation that are dynamically adapted to the individualized profile of the continuous assessment of the state of decay, stability, or the formation of new (or their generality) clusters based on the dynamics of intra-cluster and intercluster information relationships and information exchange volumes. At the same time, situational analysis should concern heterogeneous data generated by human, electronic sensors and network devices in dynamic problem environments of the digital economy for constant monitoring refinement of the assessment of the dynamically changing situation in dynamic problem environments of the digital economy.

It is supposed to develop a subject-adapted configuration of the basic characteristics of a complex of monitoring and managing the formation of individual and group cognitive-reflective models for identifying and interpreting what is happening, serving as the source of the actions of collectives of autonomous agents within the framework of virtually and organizationally structured chains (networks) - a significant for the economy - the nature, realized through information networks. Here, it is necessary to operate with working parameters of the work of information and telecommunications networks, providing individuals with information about what is happening in the economy, within the personal-cognitive supersystem of the digital economy. It is necessary to identify the system-parametric relationships (relations), incl. the amount of flow of information affecting the personality and its perception, penetration of the level of unconscious imprinting worldview stereotypes and use for identification and interpretation of what is happening. On this basis, it is possible to develop managerial decisions regarding participation in intellectual mobility in the areas of the personal-cognitive supersystem of the digital economy, formed by the results of the monitoring phase and the initial situational analysis of the studied socio-cognitive education in the dynamic problem environments of the digital economy.

For monitoring, it is supposed to develop a set of tests for predicting the effects of information "noise" as a variety of latent information attacks based on retrospective analysis and predicting the amount of flow of information affecting and affecting the personality, penetrating the level of unconscious imprinting worldview stereotypes and using for identification and interpretation of what is happening in relation to the participation of large masses of people in various forms of the manifestation of an intellectual mobility.

The results of testing should provide an opportunity to increase the observability of information and telecommunications networks, providing individuals with information about what is happening in the economy (the Internet, television and radio programs, etc.). This is especially important in the context of a potentially critical cascade development of the effect of damage from the avalanche-like distribution that disaggregates the existing clusters of [real or distorted] information about the processes occurring in the economy (state) and the acute shortage of stabilizing information tools for maintaining the normal operation of the system of governance of the state and the economy.

If, as a result of the information attack, the cognitive imprinting matrices peculiar to a particular person [as part of an isolated or unselected group - the collective of autonomous agents] in one segment of these socioeconomic communities come out of the established system for the realization of behavioral activity, this can cause a way out of the established systems of realization of all behavioral activity on the basis of cognitive imprintational matrices peculiar to a particular person in another segment of the community. And this, in turn, entails an iterative cascade damage to cognitive im-

printational matrices peculiar to a particular person [as part of an isolated or non-singled out group - a collective of autonomous agents] in many different segments of the social subsystem of the digital economy under study.

The criteria for observability should be oriented towards the aggregated personality-cognitive cluster as a functionally stable element of the organization of the personal-cognitive supersystem of the digital economy. The impact on the cluster allows preserving or disrupting the stability of the structure of social and economic relations determined by the political or other interests of individual autonomous agents within the framework of imprinted methods of identifying the surrounding reality in order to stabilize the process of ensuring consistency of successive decisions in the chains (service delivery chains) of any - significant for the economy - character or other forms of manifestation of intellectual mobility in conditions of probable destruction of the system we are in connection with information attacks.

A set of convergent information, telemetric, sensor services allows you to define a set of dynamic monitoring patterns. These patterns in the field of socio-economic processes, where the process of joining a person to an aggregated group of people (agents), united by explicit or latent political intentions, initiated by information attacks, their models of group actions, may be completed or continue, depending on the heterogeneity of the state and regime parameters functioning and interaction of distributed information objects, information networks and consumers of information. Monitoring patterns are the subpatterns of the pattern of neural networks corresponding to this target block and their analogues within the framework of the model when the parallel operation of many cognitive imprintational matrices peculiar to a particular person [as part of an isolated or not isolated group of autonomous agents] and the ability of the network to change its configuration contribute to high reliability of such a network structure, depending on the heterogeneity of the parameters of its state.

System-parametric interrelations allow calculating the "convolution" and splitting of the personal-cognitive supersystem of the digital economy in such a way that each aggregated personality-cognitive cluster is represented as a sort of aggregated information-cognitive consumer. This consumer can be strongly or loosely coupled with other aggregated personality-cognitive clusters present in the general electronic content (also available for polycentric search systems for object-oriented indexing of the web content of an individual or a cluster as a whole).

In accordance with the proposed technology, the configuration of methods for communicating to the consumer any information within the cluster and intercluster information interconnections and the amount of information exchange is made based on a system and situational analysis of heterogeneous data generated by man, electronic sensors and network devices in dynamic problem environments of the digital economy. The purpose of configuring ways to communicate information to the consumer is to maintain a balance between stability and variability (by analogy with the synchronization of cellular brain ensembles in the course of changing neural interaction) both in normal and in extreme conditions of information attack.

Monitoring makes it possible to identify the correspondence of a subject-adapted configuration of the basic characteristics of the possibility of operating the operating parameters of the information and telecommunications networks, providing the individual with information about what is happening in the economy [9].

In the framework of the personal-cognitive supersystem of the digital economy - depending on the impact of information "noise" as a form of latent information attacks - it is necessary to diagnose individual objects, segments of communities and the whole system (similar to dispersed neural circuits) to restore the structure of social and economic ties, determined by the political or other interests of individual autonomous agents within the framework of imprinted methods of identifying the surrounding reality for stabilization of the process of ensuring consistency of successive decisions in the chains (networks) of rendering services of any kind - significant for the economy - character or other forms of manifestation of intellectual mobility.

A package of methods for monitoring information and telecommunications networks that provide individuals with information about what is happening in the economy, implemented with respect to the avalanche spreading of disaggregating clusters of [real or distorted] information about the processes occurring in the economy (state), including dynamic patterns in the field of socio-economic processes. For socio-economic processes, a special danger poses a cascade failure of stability, which, due to information attacks, may result or continue, depending on the heterogeneity of the state parame-

ters and the mode of operation and interaction of distributed information objects, information networks and consumers of information.

Monitoring services should allow using application software packages to simulate the development of a situation with the orientation to maintaining the work of a set of elements of a controlled set of information and computing capacities in the context of increasing the observability of information and telecommunications networks that provide individuals with information about what is happening in the economy Internet, TV and radio programs, etc.) in interconnection with the minimum possible volumes of perception, penetration to the level of the unconscious imprinting worldview stereotypes and their use for identification and interpretation of what is happening.

This package of methods for monitoring information and telecommunications networks that provide individuals with information about what is happening in the economy presupposes the possibility of supporting the necessary activity of each cluster as a fractal part of the personal-cognitive supersystem of the digital economy when performing the functions of implementing social and economic ties determined by political or other interests of individual collectives of autonomous agents. The activity of the cluster is realized within the framework of imprinted methods of identification of the surrounding reality in order to stabilize the process of ensuring consistency of successive decisions in chains (services) providing services of any kind - significant for the economy - character or other forms of manifestation of intellectual mobility within the criteria of maintaining the necessary activity of the digital economy and the possibility regulation of these processes by government institutions of governance.

The connection of each pattern in the field of socio-economic processes, where the cascade failure of stability initiated as a result of the influence of information "noise" as a form of latent information attacks can be completed or continue [depending on the heterogeneity of the state parameters and the mode of functioning and interaction distributed information objects, information networks and information consumers] allows in the context of the situation analysis to extract information about the development of processes in the community under study and or about the results that are close to them as the basis for determining the state of the stability of the society in relation to the initial information regime with respect to the behavioral activity of the entire personality-cognitive supersystem of the digital economy as a whole.

In the system under consideration, for the analysis and decision-making in the interests of controlled fragmentation of the entire personality-cognitive supersystem of the digital economy within the framework of stable or unstable structured aggregated personality-cognitive clusters (by analogy with temporal functional neural clusters) -parametric interrelations of various aspects of the official and real political orientation of the individual, the quality of her professional training, the cultural level, interests, strong-willed qualities, internal motivation, taking into account the identification of retrospective dynamics of information underlying the personality characteristics.

The novelty of the stated approach is the development of a methodology for dynamic analysis of heterogeneous segments of the operational information space, which provides for the modeling of the work of information and telecommunications networks that provide individuals with information about what is happening in the economy to perceive the associated packets of cognitive imprint matrices.

The introduction of consolidating teams of autonomous agents of their "convolution" methods into cluster structures of a lower level than clusters and, if necessary, the division of the personal-cognitive supersystem of the digital economy in such a way that each aggregated personal-cognitive cluster is represented as its own kind, an aggregated information-cognitive consumer, strongly or loosely linked with other aggregated personal-cognitive clusters, ensures the identification of vulnerabilities to the target ION in-formational attacks on key standards of behavior, ways of implementation of socio-economic relationships [1; 8].

Vulnerability identification allows supporting the development of management decisions, planning measures for the configuration of interactive communication used to exchange information in information networks, educational, cognitive, entertaining, etc. systems, establishing feedback and taking corrective measures [7; 13].

As a result, a comprehensive solution of the issues of the structure-and-functional organization of the personal-cognitive supersystem of the digital economy is realized in the implementation of socio-economic relations determined by the political or other interests of individual collectives of auton-

omous agents within imprinted methods of identification of the surrounding reality to stabilize the process of ensuring the consistency of successive decisions in chains (networks) providing services of any kind - significant for the economy - rockets or other forms of manifestation of intellectual mobility within the criteria of maintaining the necessary activity of the digital economy and the efficiency of public administration institutions.

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