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ANALYSIS AND INTERPRETATION OF TEXT MODELS

ANALIZA I INTERPRETACJA MODELI TEKSTOWYCH

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***Abstract**: Are researched methods of text model interpretation in case of their use to describe social objects. Are considered peculiarities of their use for modeling objects which are hard to formally describe by theoretical means at the level of their detalization which will ensure necessary level of analytical possibilities for research and control of objects being modeled. In the research are proposed and developed methods of text model analysis based on use of semantic parameters which describe text model which itself is some text description in user language. As some elements of social objects accept information as its text description, so semantic coherence of texts with social object's text description characterizes a level of its perception.*

***Keywords**: model, semantics, interpretation, analysis, text description, text model transformation.*

***Streszczenie:** Czy istnieją metody badawcze pozwalające na interpretację modeli tekstowych, jeśli takie modele są zastosowane do opisu obiektów społecznych? Czy są rozważane osobliwości ich zastosowania do modelowania obiektów, które są formalnie trudne do opisania za pomocą środków teoretycznych na takim poziomie ich uszczegółowienia, który zapewni badaczom wymagany poziom możliwości analitycznych i możliwość kontrolowania obiektów będących przedmiotem modelowania? W niniejszej pracy proponowane i rozwijane są metody służące do analizy modeli tekstowych oparte na zastosowaniu parametrów semantycznych opisujących model tekstowy, który sam w sobie jest pewnym opisem tekstowym zapisanym w języku użytkownika. Ponieważ pewne elementy obiektów socjalnych akceptują informację przekazywaną w postaci opisu tekstowego, to spójność semantyczna tekstów z opisem tekstowym obiektów społecznych charakteryzuje poziom jego percepcji.*

***Słowa kluczowe**: model, semantyka, interpretacja, analiza, opis tekstowy, transformacja modelu tekstowego*

1. Introduction

Description of text models ($\mathrm{TM_i}$) and definition of parameters which can help to analyze text model is not enough to use a text model for complete description of a social object ($\mathrm{SO_i}$). To ensure more adequacy between $\mathrm{TM_i}$ and appropriate $\mathrm{SO_i}$, it is necessary to review the following: the cause of changes, taking place in $\mathrm{SO_i}$ can be factors, taking place in social objects system $\mathrm{SSO_i}$, it is necessary to take into account the dynamics of functioning of $\mathrm{SO_i}$, due to a development of social communication system it is possible to make a feedback between modeled object $\mathrm{SO_i}$ and a model $\mathrm{TM_i}$, an important factor for system $\mathrm{STM_i}$, which unite a number of $\mathrm{TM_i}$, is a possibility to perform analysis of functioning process of $\mathrm{TM_i}$ i $\mathrm{STM_i}$ in preset period, common to social systems are changes, taking place during period of time, which are accepted to be supposed as long term.
Real SO_i are influenced by a number of factors, which also can lead to state change of SO_i, which is necessary to reflect in TM_i. Such factors can take different forms, beginning with internal activity of elements in SO_i and ending with influence of environment, in which SO_i functions. Any social object can be supposed static, which mean stability of parameters which describe it. Dynamics of social objects is caused not only by external factors but also by the nature of SO_i.

2. Interpretation of social models

Let's accept that information streams are intended for implementation of control actions on SO_i and in parallel are transmitted to TM_i and lead to a fact that TM_i move from one current state to another defined in IP_i, which is characterized by other parameters meanings which can be written down as:

$$IP_i[TM_i(\sigma_{i1}, \dots, \sigma_{ik})] = TM_j(\sigma_{j1}, \dots, \sigma_{jk}).$$

Besides, processes, taking place in SO_i and not connected with influence on them by IP_i, are not defined by visibly described target, but defined by such changes of parameters, which are caused by criteria defining SO_i and are reflected in $\mathrm{TM_i}$. Such process is written down as:

$$E[TM_i(\kappa_{i1}, \dots, \kappa_{im})]=\{TM_i[\sigma_{i1}(\kappa_{i1}), \dots, \sigma_{im}(\kappa_{im})] \rightarrow TM_j(\sigma_{j1}, \dots, \sigma_{jn})\},$$

where κ_{ij} – criteria, formed in $\mathrm{TM_i}$ and respectively in SO_i, σ_{ij} – semantic parameters, describing model $\mathrm{TM_i}$ and having own interpretation in SO_i. Stability of SO_i is in fact that their functioning is uninterrupted and obligatory condition of existence of SO_i [1,2]. We can assert, that functions describing process of functioning of static or pseudo-static SO_i, are monotone [3]. Theory of dynamics of non-linear systems, to which can be taken a system like SO_i, allows a deeper approach to solving tasks of analysis of instability of SO_i [4].
Social objects are some population groups, which use personalized means of communication, typical example of which are functionally orientated networks, for example social networks, which is implemented via Internet etc [5]. This causes possibility to use such communication to implement a feedback between models TM_i and social objects SO_i. It's obvious that effective use of such feedback between SO_i and TM_i demands to take into STM_i a system of functionally

orientated monitoring (SM_i), of electronic information environment STM_i. Let's write down STM_i in a following way:

$$STM_i = F[(TM_{i1}, \dots, TM_{in})\&(SM_{i1}, \dots, \mathrm{SM_{im}})].$$

An example of SM_i can be a known systems like SRM [6]. Let's limit ourselves with the fact that due to interaction of TM_i with appropriate SM_i for the last is formed a target of information monitoring and can be set formats of information exchange between SM_i and TM_i.

A feedback described above is activated by SO_i and that's why its efficiency is quite high as the information being presented by various SO_i is not formed specially for appropriate TM_i. This is an important aspect of STM_i functioning because one of important tasks in use of STM_i is a task of management of processes which are started or can be started in a framework of system SSO_i.

If system SSO_i or object SO_i is evolution object, then in framework of those objects should be developed possibilities of internal analysis of processes, taking place in those systems. For solving the problems of analysis it is necessary to solve the following tasks: to define interpretation of parameters TM_i, which are used in process of analysis in subject area of SO_i, as TM_i are themselves texts and SO_i community of people; to define criteria of analysis of TM_i and methods of evaluation of received meanings of appropriate parameters; to define levels of generality of analysis methods and respectively to them to define level of generality of objects in TM_i and SO_i; develop method of activation of such analysis as it is internal relatively to external factors, define conditions with which it is allowable to change or modify the initial elements interpretation which are part of text models defining possibility to change to change criteria defining processes of evolution changes. Respective interpretations must reflect not only quality meaning of received numeric results but also reflect influence of appropriate numeric results on appearance of basic changes in objects being modeled. To solve this task it is necessary to create a rules system of output of new descriptions of interpretation extensions for components, received as a result of conducted analysis. It could be accepted that during transformation process which take place in SO_i and modeled in TM_i we can instantly form necessary new descriptions of interpretations. But in that case there is no close connection modeling means or models TM_i and objects being modeled. So, the processes taking place in SO_i and processes being modeled in TM_i are implemented in some kind of independent way. Generalized feedback between SO_i and TM_i which is implemented basing on use of analysis of information systems which are used by real SO_i, can not guarantee the necessary level of direct connection between SO_i and TM_i. Means of reflection of SO_i in models TM_i are quite different by their nature from SO_i, as TM_i are themselves some text descriptions and SO_i are social objects or groups of people which function not always in correspondence with one or another rules or limitations, formulated in text form.

Setting criteria of analysis of processes of functioning, which in TM_i is one or another transformation of text descriptions is a quiet complicated issue. It is caused by a fact that in any social system there is no common criteria of functioning for all SO_i from SSO_i, despite it can be declared. In that case declaration is not by itself

a set of conditions and prerequisites which can be used by various SO_i . From the formal point of view this means that from one declaration can arise different conditions. If some totality of declarations we can define as $D = \{d_1, \dots, d_n\}$, then takes place:

$$[d_{i1}, d_{i2}, \dots, d_{ik}] \rightarrow [(u_{i1}, \dots, u_{ik}) \vee (u_{j1}, \dots, u_{jn}) \vee \dots \vee (u_{e1}, \dots, u_{em}],$$

where $(u_{ij}, \dots, u_{in})$ – a system of conditions of some type or class of SO_i. Selection of some $u_i = (u_{ij}, \dots, u_{in})$ is defined by hidden conditions which do not directly reflect in appropriate d_{ij}. Let's write down hidden conditions as δ_{ij}, where $\Delta_i = \{\delta_{i1}, \dots, \delta_{im}\}$. It is natural to suppose that definition of Δ_i for some class SO_i is implemented by:

$$[(d_{i1}, \dots, d_{ik}) \& (SO_{i1}, \dots, SO_{in})] \rightarrow (\delta_{i1}, \dots, \delta_{ik}).$$

We can formulate new hypothesis.

Hypothesis 1

There is no SSO_i, for which there is no need to use Δ_i, during definition of criteria system or conditions $(u_{ij}, \dots, u_{in})$, for managing process of functioning of some SO_i з SSO_i .

The problem of evaluation of values, received as a result of analysis in case when criteria of functioning is defined or declared, is solved basing on use of interpretation descriptions of appropriate parameters and used criteria. To solve the task of definition of values analyzed in TM_i let's take the following data: mathematical nature of parameters, maximum and minimum meanings of the parameter, scale of measurements of appropriate parameters. Mathematical nature of variables, used to describe a parameter is defined from one side by abilities of interpretation means, used for description of appropriate parameter and from the other side by the task which should be solved with the use of appropriate parameter. Maximum values of evaluation scale of parameters values are defined by criteria, set for some separate SO_i and corresponding TM_i. In most cases criteria describes situations in which take place quality changes of some components of TM_i and the whole model TM_i and for those quality changes there is and can be implemented appropriate interpretation in $W(SO_i)$. The size of scale of evaluation of parameters values must be selected in such a way that each separate meaning of parameter has its own interpretation in $W(SO_i)$. In general case scales of evaluation of parameters TM_i, which have own projections in $W(SO_i)$, are non-linear.

Necessity of formal analysis of text models and their systems is caused by the following targets: setting regularities of functioning of TM_i and STM_i; ensuring possibilities of evaluation of some states of TM_i, or laps of functioning of TM_i; possibility to predict changes which can take place in TM_i and STM_i in process of their functioning; due to numeric interpretation of current states of TM_i there can be defined preconditions of critical states which can happen in SO_i; define numeric values of parameters, which can influence the process of functioning of

TM_i і SO_i, respectively by predefined method; define limits between numeric and quality evaluation of state of TM_i і SO_i and evaluation of process of their functioning; set connection between quality evaluation of parameters TM_i or SO_i and their numeric characteristics.

Due to specifics of connection between description SO_i by means TM_i, which is characterized by absence of physical dependencies between model TM_i and SO_i, there appear following peculiarities: connection between SO_i and TM_i is implemented only by information means, which do not appear physically in the process of realization of that connection; becomes actual the task of ensuring the adequacy of processes which are implemented in model with processes which take place in SO_i; specifics of reaction of components SO_i on information control streams which are transmitted to selected SO_i and methods of visualization in models TM_i of those information streams should take in account their specifics; it is necessary to form a possibility of activation of feedback between SO_i and TM_i basing on use of information streams, orientated on SO_i; due to existence of natural differences between SO_i and TM_i control information streams IP_i , guided to SO_i and TM_i, must differ between each other by form of representation of the same information.

To define regularity of functioning of TM_i in some period of time, it is necessary to enlarge means and methods of identification of different text components TM_i and object SO_i, which by definition is a set of separate components. In that case appears a task of distribution of description of TM_i into fragments in such a way that appropriate fragments could identify separate components of SO_i. Going out of semantic parameters we can accept the following [7]. Let TM_i consists of separate paragraphs. Let us accept that in framework of one paragraph are located data of one component SO_i. One component SO_i corresponds to one group, each of them consists of m persons, then we have correlation: m>3. For distribution of separate components in SO_i and TM_i, respectively, are used following parameters: semantic value of paragraph π_i^z, semantic controversy of paragraphs π_{ij}^s=π^s(i,j), where i,j – indexes of different paragraphs, semantic correlation of paragraphs $\pi^u(i,j)$ and sentences in a paragraph.

Definition of parameters used during model analysis

Definition 1. Semantic value of paragraph π_i^z is defined by the number of different words which form phrases and sentences of the paragraph.

Formally it is written down by correlation: π^z(i)=$\sum_{i=1}^{m} Sg(x_i, \pi_i)$, where function S$g(x_i,\pi_i)$ is defined in a following way:

$$Sg_i(x_i,\pi_i) = \{[(x_i \neq x_j)\&(j<k)] \rightarrow Sg(x_i,\pi_i) = Sg_{i-1}+1\}$$
$$Sg_i(x_i,\pi_i) = \{[(x_i = x_j)\&(j<k)] \rightarrow Sg(x_i,\pi_i) = Sg_{i-1}+0\}.$$

As TM_i makes description of SO_i in a normalized form, then in TM_i there is no semantic excessiveness.

Definition 2. Semantic controversy between paragraphs i and j, or $\pi^s(i,j)=\pi^s_{ij}$ is defined by a difference of semantic meanings of two paragraphs $\pi^s(i,j) = |\pi^z(i) - \pi^z(j)| - \Delta s_i$ with pre-set threshold of possible value of controversy Δs_i, which is defined basing on analysis of subject area of interpretation of TM_i, which is marked as W_i.

Definition 3. Semantic correlation between paragraphs i та j, or π_i і π_j is defined by level of semantic value of two paragraphs, that are described by correlation:

$$\{(\pi^s(i,j) < 0) \to [[(\pi^u_{ij} = |\pi^z_i - \pi^z_j|) \geq 1] \& [(\pi^u_{ij} = 0) \to (\pi_i \equiv \pi_j)]\}.$$

In the framework of π_i level of semantic controversy σ^s is measured between neighbor words: $\sigma^s(x_i, x_j) = \sigma^z(x_i) - \sigma^z(x_j)$. Inside paragraph π_i change of σ^s can be reflected as some curve, interpreted by selected formula. If we take Lagrange multinomial as interpretation formula [8], then we can accept that $L_i(x_i)$ is one of characteristics of $\pi_i(TM_i)$. For two different π_i and π_j there can be the following correlation:

$$\{L_i(x_i,\pi_i) = L_j(x_i,\pi_j)\} \vee \{L_i(x_i,\pi_i) \neq L_j(x_i,\pi_j)\}.$$

Having $L_i(x_i,\pi_i)$ and $L_j(x_i,\pi_j)$ we can numerically evaluate semantic conformity π_i and π_j in following way. Let us randomly select the value of x_i, which is set by the current value of word number starting at π_i and respectively π_j. Then we calculate value $L_i(x^*_i,\pi_i)$ and value $L_j(x^*_i,\pi_j)$. We define difference: $(L_i(x^*_i,\pi_i) - L_j(x^*_i,\pi_j) = \Delta L_k(\pi_{ij})$. We make the above calculations for a number of selected points x^*_i, due to that we receive a number of selected values $\Delta L_k(\pi_{ij})$, which we will mark as ξ_i. On values of selection $\{\xi_1, \dots, \xi_k\}$ we will calculate dispersion $D(\xi_i)$. If $D(\xi_i) \leq \aleph_i$, then corresponding paragraphs π_i and π_j will be semantically settled and belong to the same class SO_i. From the Physical point of view the process of functioning of SO_i is uninterrupted. Relatively to TM_i, process of functioning of SO_i is reviewed only as substitution of information about SO_i, which can take place in following cases: during action of some information stream IP_i on SO_i and, respectively, on TM_i, with changes in SO_i, which is caused by different internal reasons. That's why process of functioning of SO_i is reviewed only at the level of changes which take place in TM_i, physically reflecting in appropriate text descriptions of TM_i. Such process takes place discrete with different steps of discretion. Let us review the following forms of functioning of TM_i.

Each semantic parameter has some definite range of possible meanings which has appropriate $j[[\sigma_i(\alpha,\beta)]$ in subject area of interpretation $W_i(SSO_i)$. While value of one or several parameters change in allowed TM_i is located in static mode of functioning, and change of static mode is made only in case when values of appropriate parameters go out of allowed threshold.

Next form of functioning takes place in case when separate TM_i and SO_i are transmitted to IP_i. In that case values of semantic parameters change according to targets, setting forming of one or another IP_i.

Definition 4. Information stream IP_i is called balanced if its influence on TM_i does not result in movement of values of semantic parameters σ_i out of allowed threshold, which is described by correlation:

$$\{IP_i(TM_i)\&[\inf(\sigma_i) < \sigma_i(TM_i^*) < \sup(\sigma_i)]\} \to IP_i^B.$$

Action of IP_i can lead to such changes of values of σ_i, which can get out of allowed threshold.

Definition 5. Information stream is called unbalanced if its influence on TM_i lead to getting of values of semantic parameters σ_i out of allowed threshold and is described by correlation:

$$\{IP_i(TM_i)\&[[\inf(\sigma_i) > \sigma_i(TM_i^*)] \vee [\sigma_i(TM_i^*) > \sup(\sigma_i)]]\} \to IP_i^N.$$

In above correlations $\inf(\sigma_i)$ and $\sup(\sigma_i)$ are lower and upper thresholds of allowed values of semantic parameter σ_i. One of targets of IP_i influence on TM_i can be moving TM_i to such state, when σ_i gets out of allowed value threshold.

Definition 6. If σ_i in TM_i gets out of allowed value threshold then such TM_i is moved to critical state TM_i^k.
Interpretation of TM_i^k can be in following. If in SO_i is fed IP_i^B, then corresponding changes in SO_i, which is implemented basing on action of IP_i^B, are acceptable for SO_i and that's why they are accepted for implementation in the framework of SO_i. Such changes are reflected in text descriptions of TM_i and as a result $TM_i \to TM_j$. If to SO_i is transmitted IP_i^N ,then there could be following situations: corresponding IP_i^N is not accepted by SO_i, if it is not recognized as unbalanced, if IP_i^N is not recognized before influence of IP_i^N on SO_i, then under influence of IP_i^N, SO_i moves to critical state which is appropriately reflected in TM_i, and described by correlation: $IP_i^N(TM_i) \to TM_i^k$.

Analysis of text models

Description of functioning of TM_i can be a sequence of transitions of TM_i from one state to another relatively to time parameter, or any other parameter, selected for synchronization of changes which take place in

$$TM_i: \quad \mathcal{F}(TM_i) = (TM_{i1} \to TM_{i2} \to \cdots \to TM_{in}).$$

The above correlation reflects changes at the level of separate model TM_i. Let us review separate fragment of transitions $TM_{ij} \to TM_{ik}$ at the level of interaction of separate fragments of corresponding text descriptions $\mathrm{IP_i}$ and TM_i, whish are:

$$j[x_i(IP_i)] \,\&\, j[x_j(TM_i)] \to j[x_k(TM_i^*)].$$

In case of reflection of interaction of the whole stream IP_i from TM_i corresponding correlation can be written down as:

$$\{J[(x_{i1}, \ldots, x_{im}) \Rightarrow IP_i]\&J[(x_{j1}, \ldots, x_{jn}) \Rightarrow TM_j]\} \to [J(x_{k1}, \ldots, x_{kr}) \Rightarrow TM_k].$$

In given correlation separate variables x_i can be interpreted as separate words of corresponding natural language or as separate phrases $\varphi_i = (x_{i1}, \dots, x_{ik})$, where φ_i is made of words $(x_{i1}, \dots, x_{ik})$. In that case let us make analysis of semantic parameters on following levels: at the level of separate words $x_{i1}, \dots, x_{ik}$, which are combined into separate phrases $\varphi_i = (x_{i1}, \dots, x_{ik})$, at the level of separate phrases $(\varphi_{i1}, \dots, \varphi_{im})$, which are combined into separate sentences $\psi_i = (\varphi_{i1}, \dots, \varphi_{im})$, at the level of separate paragraphs $(\pi_{i1}, \dots, \pi_{in})$, which are combined into plot $h_i = (\pi_{i1}, \dots, \pi_{in})$, which is described by corresponding model TM_i. In descriptions of interaction of two information components, which are presented in form of test descriptions $j(x_i)$, let us accept following points.

Point 1. Synthesis of two information components is implemented firs at the level of phrases of those components if they are text descriptions, and then – in framework of sentences, paragraphs and whole text of TM_i.
This point supposes hierarchical dependency between separate text components in sequence, which implements synthesis of texts $\mathrm{IP_i}$ and TM_i in case of influence of $\mathrm{IP_i}$ on model TM_i and, respectively influence on object SO_i itself. Such sequence can be presented by scheme:

$$\mathcal{F} = \{f(\varphi_i, \varphi_j) \to F(\psi_i, \psi_j) \to \Phi(\pi_i, \pi_j)\},$$

where f, F, Φ - synthesis functions, φ_i, ψ_i, π_i – elements of TM_i, φ_j, ψ_j, π_j - elements of $\mathrm{IP_i}$. Transitions between $f \to F \to \Phi$ are possible only in case when previous synthesis function did not result in rise of critical situation in framework of TM_i. On each synthesis stage which we will call: $f(\varphi_i, \varphi_j)$ - phrase synthesis, $F(\psi_i, \psi_j)$ - sentences synthesis, $\Phi(\pi_i, \pi_j)$ - paragraphs synthesis, it is necessary to calculate semantic parameters, which describe separate components φ_i, ψ_i, π_i.
The presented correlation in general case describes sequence of implementation of separate stages of synthesis of text fragments of $\mathrm{IP_i}$ and TM_i. At the first stage is implemented synthesis of phrases $\varphi_i \in TM_i$ and $\varphi_j \in IP_j$. Semantic parameters of phrases are defined basing on semantic parameters of its words. That's why arises task of definition if semantic parameters of words do not result in fact that the last ones will contradict the results of analysis of semantic values of phrases. For example, if at the stage of synthesis $f(\varphi_i, \varphi_j)$ appears that $\sigma^s(\varphi_i, \varphi_j) \leq \sup(\sigma_i^s)$, then there will take place situation when $\sigma^s(x_i, x_j)$ with (x_i & x_j)$\in \varphi_i$, or $\sigma^s(x_i^*, x_j^*)$, with $(x_i^* \& x_j^*) \in \varphi_i^*$, will not cross allowed thresholds. Such thresholds can be defined for $\sigma^s(x_i, x_j)$ separately from thresholds for $\sigma^s(\varphi_i, \varphi_j)$. This is defined by peculiarities of interpretation of words and phrases in specific subject area. In most cases of subject areas of interpretation, especially when subject area is a set SO_i, threshold areas of values for $\sigma^s(x_i, x_j)$ and $\sigma^s(\varphi_i, \varphi_j)$ are same. Let us review following statement.

Statement 1. If as a result of synthesis $f(\varphi_i, \varphi_j)$ appeared that $\sigma^s(\varphi_i, \varphi_j) \in [\inf(\sigma^s_\varphi); \sup(\sigma^s_\varphi)]$, then with fulfillment of condition $(x_i, x_j) \in [(\varphi_i \& \varphi_j) \vee \varphi_i \vee \varphi_j]$, is fulfilled $\sigma^s(x_i, x_j) \in [\inf(\sigma^s_x), \sup(\sigma^s_x)]$. This statement means following. If as a result of synthesis $f(\varphi_i, \varphi_j)$ appeared that level of semantic controversy $\sigma^s(\varphi_i, \varphi_j)$ is allowed, then level of semantic controversy for words x_i, x_j, which are in $\varphi_i \cup \varphi_j$ is allowed. For TM_i at the level of separate words x_{ir} have own value $\sigma^z(x_{ir})$, which is determined based on use of semantic dictionary $S_c(W_i)$. Process of forming $f(\varphi_i, \varphi_j)$ in environment $J(TM_i)$ results in filling fragment $tm_i \in TM_i$ by fragment from IP_i, or $\varphi_j \in IP_i$. Phrases $\varphi_i \in TM_i$ and $\varphi_j \in IP_i$ are characterized by semantic parameters $\sigma_i(\varphi_i)$ and $\sigma_j(\varphi_j)$, which satisfy statement conditions. That's why φ_i і φ_j separately satisfy conditions:

$$\inf[\sigma_i(x_i)] \le \sigma_i(x_i \in \varphi_i) \le \sup[\sigma_i(x_i)]$$

and condition

$$\inf[\sigma_j(x_j) \le \sigma_j(x_j \in \varphi_j) \le sup\sigma_j(x_j)].$$

As $\sigma_i(\varphi_i) = f[\sigma_{i1}(x_{i1}), \ldots, \sigma_{ir}(x_{ir})]$, then $inf\sigma_i(\varphi_i) \le \sigma_i(\varphi_i) \le sup\sigma_i(\varphi_i)$. In opposite case $f[\sigma_{i1}(x_{i1}), \ldots, \sigma_{ir}(x_{ir})]$ could be incorrect. Basing on same suppositions we can show, that takes place $inf\sigma_j(\varphi_j) \le \sigma_j(\varphi_j) \le sup\sigma_j(\varphi_j)$. Let us analyze peculiarities of interaction of SO_i with IP_i, which are text streams, as such peculiarities reflect main properties of perception of corresponding IP_i by object SO_i [9,10]. Such perception and peculiarities are in following: IP_i are structured; structure of IP_i is hierarchical; with interaction of IP_i with SO_i is implemented step by step synthesis of elements of structure SO_i, which is described by synthesis of elements IP_i with elements of model TM_i, which models corresponding SO_i; are defined integral parameters of models TM_i, which describe corresponding changes in SO_i; is performed comparison check of changes in SO_i basing on corresponding evaluation of changes in TM_i. Let us accept that any action on SO_i and respectively on TM_i of information stream IP_i,is not accidental but is initiated basin on description of definite target, formed by means which are external relatively to TM_i. Under external means we mean sources IP_i and TM_i with STM_i relatively to TM_j. Let us accept following statements.

Statement 2. Any IP_i is formed according to target which should be reached by data of IP_i on SO_i, which is reflected by interaction IP_i з TM_i.

Statement 3. Basic characteristic of target of forming of IP_i is ensuring of maximum efficiency of influence of IP_i on SO_i, which is reflected in interaction of IP_i with corresponding TM_i.

Statement 4. Target can consist of following components: visible and partially hidden, only visible component and only conditional component.

Visible component of target is shown in IP_i in text form. Supplied above peculiarities of perception of IP_i by objects SO_i have general character. It was

mentioned above that in framework of STM_i, which is used for modeling of SSO_i system are used normalized forms of presentation of text descriptions of fragments of IP_i. It is obvious that normalized forms of presentation of descriptions of IP_i, for perception by SO_i objects are not acceptable. That's why for system STM_i are characteristic following peculiarities: in framework of STM_i are formed IP_i in natural for SO_i form of text descriptions of corresponding streams of IP_i, for modeling of action IP_i on SO_i with the help of TM_i corresponding descriptions of IP_i are normalized in the framework of STM_i. Beside target of modeling of SO_i with help of TM_i, is solved task of verification of separate TM_i with corresponding SO_i [11,12].
Peculiarities of perception by SO_i of corresponding IP_i, must be taken in account while forming IP_i, because in that case appears possibility of increase of efficiency of influence of IP_i on corresponding SO_i. One of such peculiarities is structuration of IP_i. Structure of IP_i in form of text description is defined by the following factors: semantic structuration G^S, text structuration G^T. Semantic structuration G^S is defined basing on delegating to some separate elements of text of one or another values for selected semantic parameters. This is preconditioned by necessity to reach the most possible effective influence of IP_i on SO_i. Usage during forming of IP_i ,of one or another values of σ^S or σ^{K^i} allows ensuring more active SO_i, during analysis of IP_i by corresponding SO_i of given fragments of IP_i. Such structuration is closely bound to information value of separate fragments of IP_i, which we will mark as $J^Z(\varphi_i)$, and allows to extract it in the framework of whole IP_i stream.

Statement 5. Random IP_i consists of fragments which have different information value and level of distribution in framework of IP_i of information value of separate components $J^Z(\varphi_i)$ influences efficiency of influence of IP_i on SO_i.

Coming out this statement we can say that semantic parameters σ^i allow to determine different levels of information value of separate fragments of text descriptions $tm_i \in TM_i$. This fact formally can be described by correlation:

$$J^Z(tm_i) \Rightarrow f[\sigma^k_{i1}(\varphi_{i1}), \dots, \sigma^k_{im}(\varphi_{im})].$$

Statement 7. Value $J^Z(tm_i)$ is derivative from function $f[\sigma^k_{i1}(\varphi_{i1}), \dots, \sigma^k_{im}(\varphi_{im})]$ and is determined according to set rules.

Text structuration G^T reflects method of placing of text image in framework of IP_i. Obviously G^T must be connected to G^S. Structuration of G^T has limited abilities of its implementation due to single dimension of text reflections.

3. Conclusions

In research is developed method of use of text models for research of objects which are hard to formalize with required level of adequacy to object. Basing on text models there is a possibility to research processes of control of social objects due to use of semantic parameters which are proposed in this research. Proposed methodic allows conducting evaluation of level of influence of control text information on controlled object which is capable to accept text recommendations on activation of processes of modification of corresponding objects.

Beside determination of semantic parameters which are needed for research of text models, are developed principles of organization of process of functioning of such models which are based on imagination about balanced and unbalanced information streams. Ways of functioning of corresponding models are determined by developed regulations which determine requirements to way of functioning and requirements to content of information streams, which are designed for activation of processes of functioning of objects and respectively models..

Research, conducted basing on developed methodic showed that efficiency of influence of text information being transmitted to object, can be determined basing on analysis of modified text description of the object which received the control information.

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