IDENTIFICATION AND PREDICTION OF THE STATE OF THE CONTROL OBJECT, DEVELOPMENT OF CONTROL ACTIONS

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This type of work is carried out using the subsystems "Recognition" and "Analysis". These subsystems provide: input of a recognizable sample; batch recognition ; output of recognition results and their evaluation , incl. using data on the differential validity of the model.

An in-depth analysis of the content information model of the subject area is performed in the "Typology" subsystem, which includes:

1. Informational and semantic analysis of classes and features.

2. Cluster -constructive analysis of recognition classes and features, including visualization of the analysis results in the original graphical form of cognitive graphics (semantic networks of classes and features).

3. Cognitive analysis of classes and features (cognitive diagrams and Wolf Merlin diagrams).

The "Eidos" system includes *seven* subsystems: "Dictionaries", "Education", "Optimization", "Recognition", "Typology", "Analysis", "Service".

The structure and interaction of these subsystems make it possible to fully implement all aspects of SC analysis in a user-friendly form. The generalized structure corresponds to both the control structure and the system dialogue tree.

The subsystem "Dictionaries" provides the formalization of the subject area. It implements the following modes: classification scales and gradations; descriptive scales and gradations; gradations of descriptive scales; hierarchical levels of organization of systems; automatic input of primary features from text files; postal service for reference information; questionnaire printing.

Classification scales and gradations are designed to enter a directory of future states of the active control object - classes. Mode: "Classification scales and gradations" maintains a database of classification scales and gradations of classes: input; adjustment; removal; printout (to a text file); sorting; database search.

Descriptive scales and gradations are intended for entering directories of factors influencing the behavior of the active control object - signs. This mode provides input, deletion, correction, copying of the names of descriptive scales and associated gradations. A characteristic feature of the "Eidos" system is the possibility of using non-alternative gradations, which can be a different number on different scales (within a wide range). The directory allows you to work directly with gradations (taking into account links with scales), see their total number, as well as view and print the percentage distribution of respondents' answers by.

Levels of system organization (Wolf Merlin levels) are an independent way of classifying classes and factors, which makes it easy to create and analyze their various subsets both by themselves and in comparison with each other. VS Merlin proposed an integral concept of individuality, in which he considered the interaction and interdependence of different levels of personality traits: from genetically predetermined to socially determined and reflecting a momentary state.

The system "Eidos" provides an apparatus that allows you to classify factors in such a way that it becomes possible to explore the various levels of their organization and interdependence. Class organization levels are designed to classify the future states of the active control object as target and undesirable from the point of view of the control object itself and the control system, as well as various combinations of these options. Other types of classification are also possible.

The Eidos system provides a solution to the problems of attributing anonymous and pseudonymous texts (establishing probable authorship), dating texts, determining their belonging to certain traditions, schools or currents of thought [31, 34]. At the same time, the various structures that make up the texts are considered as their attributes. The system "Eidos" implements a special mode that provides automatic detection and input of these text attributes directly from text files.

The technology of work in the "Eidos" system does not provide for the simultaneous work of many users with the same databases in the mode of updating records. Therefore, it is possible to effectively organize distributed work using multi-machine technology without using a LAN. To ensure the necessary identity of directories on different computers, the "Post service according to NSI" mode is used.

Classification scales and gradations in economic, socio-psychological and political research are often questionnaires. To print them to a file (to a subdirectory "TXT") is the mode: "Print questionnaire". In the "Eidos" system, all text and graphic input and output forms are automatically saved as files that are convenient for use in various applications under Windows .

This subsystem provides input and correction of the training sample, its management, synthesis and adaptation of the model based on the data of the training sample, export and import of data from other computers.

For the input-correction of the training sample, the corresponding mode is used, which has a two-window interface that allows you to enter two-vector descriptions of objects into the training sample. The left window is used to enter the classification characteristics of the object. In this window, each object corresponds to one line with scrolling. In the right window, a descriptive characteristic of the object is entered in the language of features. Each object has a scrollable window. The transition between windows is carried out by pressing the "TAB" key. The number of objects in the training sample is not limited. There is practical experience in carrying out calculations with training sample sizes up to 7000 objects, the total number of gradations of descriptive scales up to 3900 and the number of classes up to 1500. The possibility of automatic formation of training sample objects by encoding text files is also implemented.

The system implements a number of software interfaces that provide automatic generation of classification and descriptive scales and gradations, as well as a training sample:

– import of data from files of the "Text DOS" standard;

– data import from DBF-files, prof. A.N. Lebedeva ;

– import of data from transposed DBF-files, the standard of Professor A.N. Lebedev ;

– generation of a random model;

– generation of a training model for studying the properties of natural numbers. This mode is designed to control the training sample by parametrically specifying subsets of questionnaires for processing, combining classes, automatic repair of the training sample ("repair or weighting of data"). Parametric selection of a subset of questionnaires for processing can be carried out logically and physically (recommended 2nd option), this is done by comparing with a questionnaire-mask. It specifies the codes of those classes and features that must be present in all questionnaires of the processed subset. Mode: "Statistical characteristics of the training sample. Manual repair" is designed to identify weakly represented classes (for which there is not enough data) and combine several classes into one. In this case, the class directory is regenerated and the questionnaires of the training sample are automatically recoded . *In the "Automatic repair of the training sample (repair or weighting of data)" mode, BKOSA-2.2 is implemented :* the frequency distribution of objects by categories, characteristic of the general population (or other), is set, then *sequential subsets of the questionnaires of the training sample are automatically formed (with an increasing number of questionnaires) , at each stage maximally corresponding to the given frequency distribution of the general population.*

The system recommends the optimal (according to these two criteria) subset and allows you to exclude the rest of the questionnaires from consideration.

When the minimax is reached, we can talk about ensuring structural representativeness.

This mode provides: calculation of the matrix of absolute frequencies, search and exclusion from further analysis of artifacts, calculation of the matrix of informativeness , calculation of the matrix of conditional percentage distributions, batch mode for automatic execution of the above 4 modes, as well as a research mode that provides measurement of the convergence rate and semantic stability of the generated content information model.

In this mode, all questionnaires of the training sample are sequentially read and object descriptions are used to generate statistics of feature encounters in the context of classes. The screen visually displays the stage of this process, which can take a significant amount of time with large dimensions of the problem and the size of the training sample. In addition, at the qualitative level, the filling of the matrix of absolute frequencies with data is displayed in red: classes correspond to columns, and features correspond to rows. Therefore, a significant fragmentation of the data is easily detected even at this stage. This mode provides complete "data decoupling" and *the independence of the execution time of the processes of model synthesis and its analysis from the size of the training sample* . In addition, in this mode, 4 types of formally detectable errors in the source data are detected and a report file is generated based on them.

In this mode, based on the study of the frequency distribution of the frequencies of occurrences of features in the matrix of absolute frequencies, the following conclusions are drawn:

- about the lack of statistics and the impossibility of detecting and excluding artifacts;

- about the availability of statistics and the possibility of detecting artifacts (if the frequency of occurrences of features grows in proportion to the size of the training sample, then this is normal, artifacts are considered features for which this pattern is violated).

Based on these findings, a frequency that is recognized as insignificant and characteristic of artifacts is recommended, and the databases are re-formed with excluded artifacts.

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