Vetrov Anatoly Nikolaevich

www.vetrovan.spb.ru
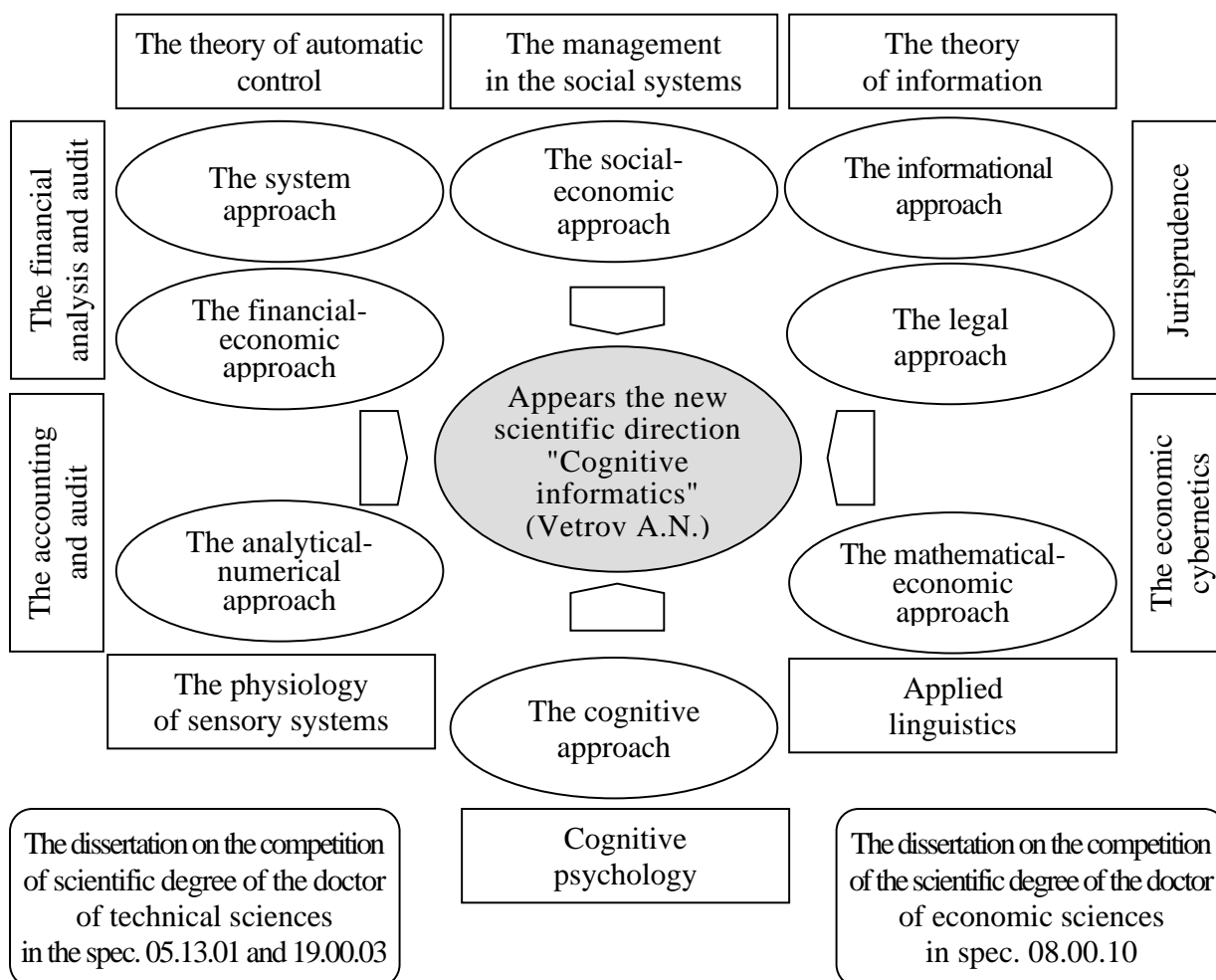
vetrovan@nwgsm.ru

RF, Saint-Petersburg city

THE FEATURES OF THE COGNITIVE CYLINDER AND THE COGNITIVE SPHERE FOR THE TASKS OF THE SYSTEM AND FINANCIAL ANALYSIS OF THE DIFFICULT OBJECT, PROCESS AND PHENOMENON

The globalization directly has a significant impact on the global economic integration, the association of international, regional and local information environments of the consumption of information.

Cognitive informatics as a new scientific direction in the theory of information, which determines the priority directions of development of the modern science: informatics in living and society, cybernetics, hardware, the bases of algorithmizing and programming, the structures of data, modeling, the intellectual systems, industry, energetics, economics, ecology, psychophysiology, cognitive psychology and cognitive linguistics (pic. 1).


Pic. 1. The genesis of cognitive informatics in technics and economics

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The genesis of the cognitive approach is directly caused by the possibility of the vertical, horizontal and trend financial analysis based on the analytical coefficients system by means of the cognitive models (pic. 2).
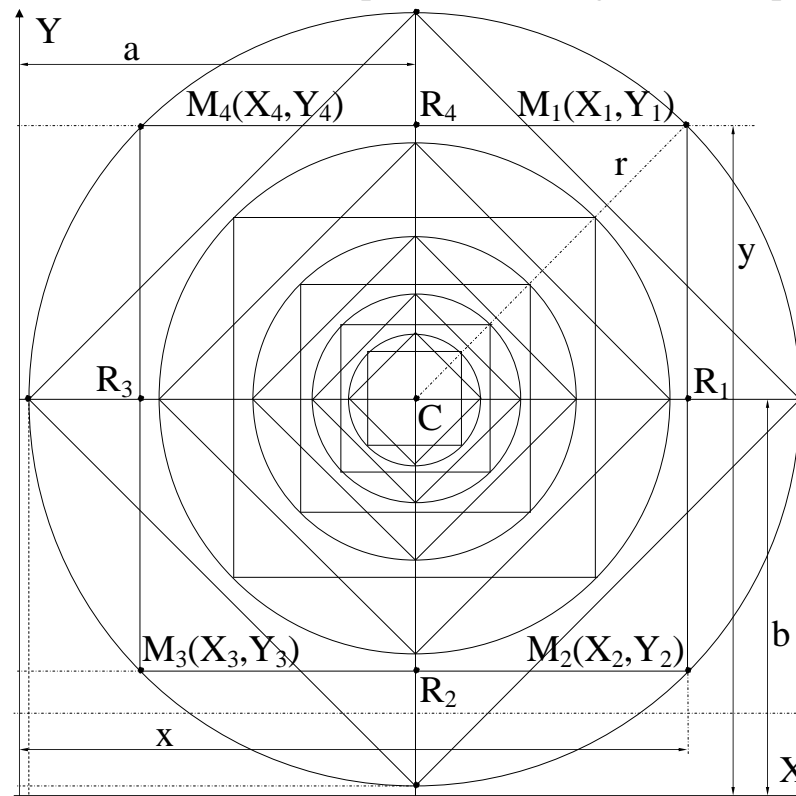
The cognitive sphere (cylinder) of the difficult object, process or phenomenon acts as the (re)constructed in volume (in width and depth) repertoire of parameters, which directly includes a spherical set of portraits (PR_v^I) with a certain scientific justification and mutually embedded simple spheres on two spherical levels: a set of the kinds of properties (KP_v^J) and properties (Pr_v^K), a set of the vectors of parameters (VP_v^L) and the elementary parameters (P_v^M).

A significant value is directly presented the central axial section of the presented cognitive sphere (pic. 2).
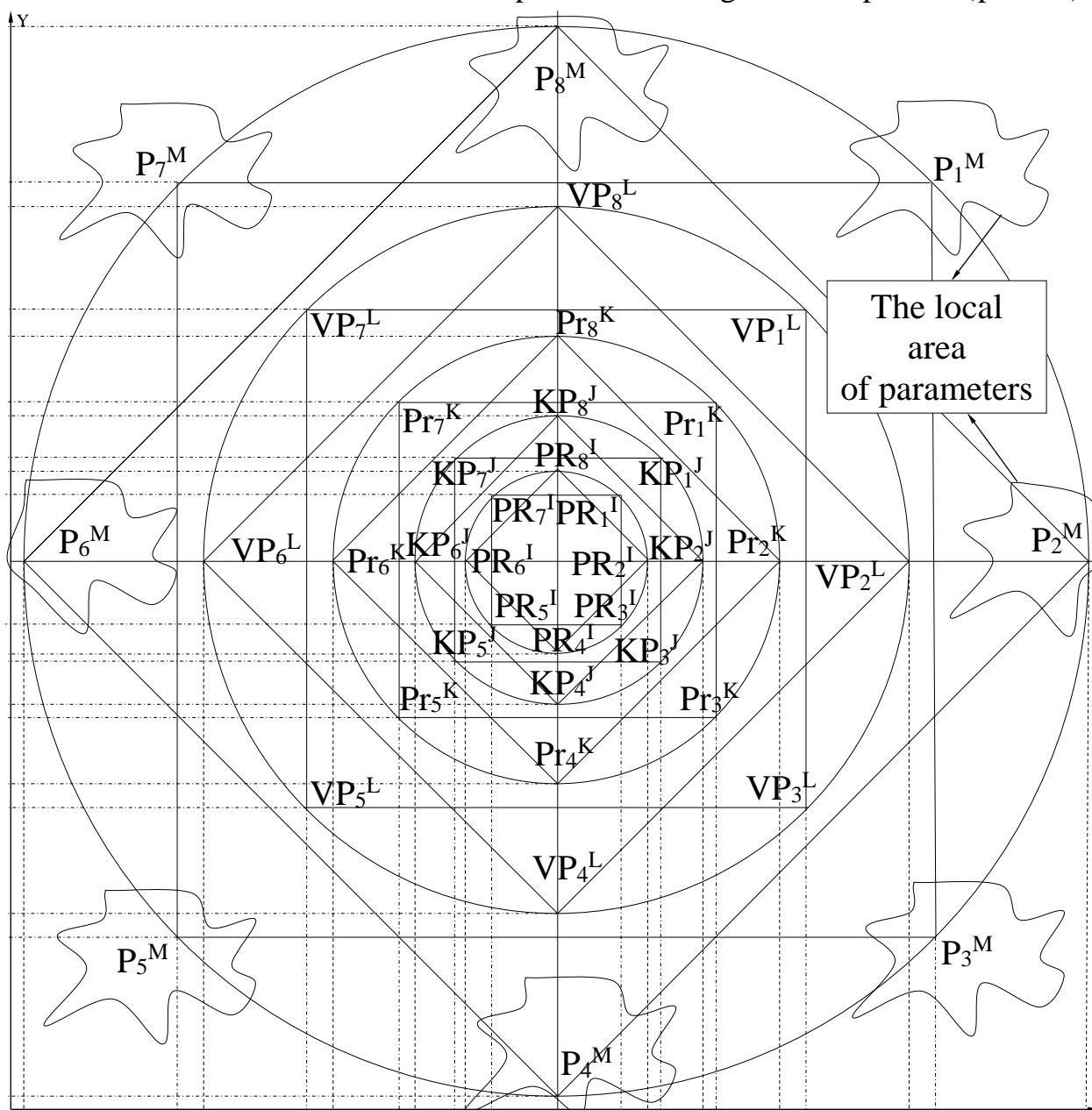
Pic. 2. The cognitive sphere for the system and financial analysis of the difficult object, process and phenomenon

At the spatial rotation the statics and dynamics of movement of the existing material points on the surface of the cognitive spheres with the elements of various sets are represented the significant importance (pic. 3).

Pic. 3. The mathematical model of the cognitive sphere

A. The geometric dimensions (measurements) of the cognitive sphere: $\begin{cases} CR_1 = x - a; \\ CR_2 = \sqrt{r^2 - (x-a)^2}; \\ CR_3 = \sqrt{r^2 - (y-b)^2}; \\ CR_4 = y - b. \end{cases}$	B. The radius of the cognitive sphere: $r = \sqrt{(x-a)^2 + (y-b)^2}$.

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C. The coordinates of material points of the cognitive sphere in static:

$$\begin{cases} x_1 = x = a + CR_1; \\ y_1 = y = b + CR_4. \end{cases} \qquad \begin{cases} x_3 = a - CR_3; \\ y_3 = b - CR_2. \end{cases}$$

$$\begin{cases} x_2 = x - a = a + CR_1; \\ y_2 = y - (CR_2 + CR_4) = b - CR_2. \end{cases} \qquad \begin{cases} x_4 = a - CR_3; \\ y_4 = b - CR_4. \end{cases}$$

D. The movement of material points of the cognitive sphere and distance (projections):

$$\begin{cases} R_1M_1 = \sqrt{r^2 - CR_1{}^2} = \sqrt{r^2 - (x-a)^2}; \\ R_1M_2 = \sqrt{r^2 - CR_1{}^2} = \sqrt{r^2 - (x-a)^2}. \end{cases} \qquad \begin{cases} R_3M_3 = \sqrt{r^2 - CR_3{}^2} = y - b; \\ R_3M_4 = \sqrt{r^2 - CR_3{}^2} = y - b. \end{cases}$$

$$\begin{cases} R_2M_2 = \sqrt{r^2 - CR_2{}^2} = x - a; \\ R_2M_3 = \sqrt{r^2 - CR_2{}^2} = x - a. \end{cases} \qquad \begin{cases} R_4M_4 = \sqrt{r^2 - CR_3{}^2} = \sqrt{r^2 - (y-b)^2}; \\ R_4M_1 = \sqrt{r^2 - CR_3{}^2} = \sqrt{r^2 - (y-b)^2}. \end{cases}$$

The conceptual bases and the theory have an impact on the development of science.