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« » ( .: , 1966. - .25) ,

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[6]

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## INFORMATION FLOWS IN THE ORGANIZATIONAL STRUCTURE

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**Summary. Problem statement.** Information flows in organizational management structures are caused by a number of factors such as efficiency of administrative staff, level of uncertainty of the current state of control object, required level of precision (reliability) to achieve the end result - control objectives. The effectiveness of control system depends on its ability to maintain a certain state of the system within a range of uncertainty. It is an objective reality, because the deterministic condition is theoretically possible, but not practical. Therefore, by examining in more detail the information flows in organization management on the basis of the theory of information, we can identify common ways of increasing the organization controllability, determine the dependence of uncertainty level of the state of the control object on the control mode of that object. Analysis of recent research. Item "information" is closely connected with such important term as "entropy", which is primary in relation to information. Uncertainty is considered as a measure of information. [7] Uncertainty is understood as the problem of deciding under conditions in which certain solutions lead to different results, depending on the probability of influence factors [14]. The entropy in information theory, according to the statement of K. Shannon, serves as a measure of uncertainty of the condition or behavior of the system under these conditions. Comparing given, it can be noted that a measure of uncertainty serves entropy, in turn "information is communication, connection, which reduces uncertainty". Thus, none of these categories is not separate from each other.

Leon Brillouin in the book "Scientific Uncertainty and Information" - M.: Mir. 1966. pp. 25 noted that only the "related information" will represent negentropy. In relation to the management process, the concept of "related information" could be understood as a message that has been accepted by subject of management and administrative action were taken in relation to it, which led to the improvement of the control system. The paper [6] contains an axiom "change of intrasystem information occurs so that the growth of negative entropy (measure of order) system reduces the entropy (measure of disorder) in the system". **Object and purpose.** In these studies, it was discussed in detail the processes in the chain - the entropy, information, negentropy, but the balance of the system is possible when there is a feedback of negative entropy to the entropy, and this is one of the goals of the work, the second objective is to determine the system control mode according to the set level of uncertainty of the control object. **Conclusions.** Stable operation of the open-driven organizational structure is provided by dynamic balance between accumulated therein entropy and negentropy, the balance between them is done through the exchange of information and negainformation.

Rate of entropy growth in the system, level of required accuracy of determining the value of monitored parameters, which determine the current state of the system, affects the level of control of the organization.

**Key words:** *Information, entropy, negentropy, negainformation, information flows, controllability of organizational structure.*

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 [5] « - - ,  
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$$H(X) = - \sum_{i=1}^n p_i \log p_i; \quad (1)$$

$$I_X = - \sum_{i=1}^n p_i \log p_i. \quad (2)$$

- ( . ).
- ( . ).
- « , , -  
 » [3],
- ( . ). , [11].
- [2]. «
- , »,

[11].

$$I = \log p_1 - \log p_0 = \log \frac{p_1}{p_0}, \quad (3)$$

$$I + S = 1.$$

$\left( \frac{p_0}{p_1} \right)$ ; « $I > 1$ ,  $S < 1$ » [15]

1966. - . 25)

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[16].

$$J(p) = S(\Theta) - S(p), \quad (4)$$

$S(\Theta)$

»,

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$p$ ,

$S(p)$

$p$ .

[4].

[3]

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» [4].

$$= \log_b n + \sum_{i=1}^n p_i \cdot \log_b p_i. \quad (5)$$

[2; 7; 15],

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[2]

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(S)

$$I + S = const.$$

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(5) « »

[3],

[8], «

( ) « », «

[10]: = =

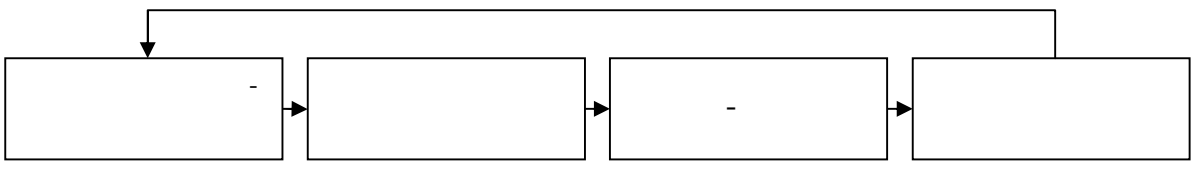
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[6] «

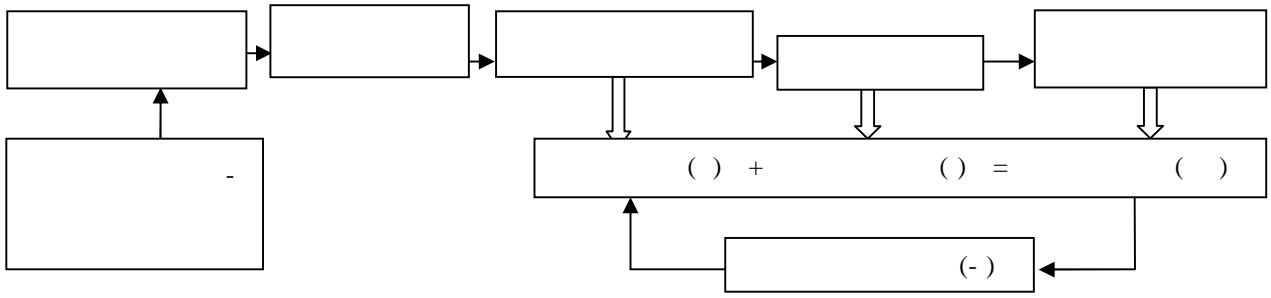
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=  $\log 2N$ .



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.2.

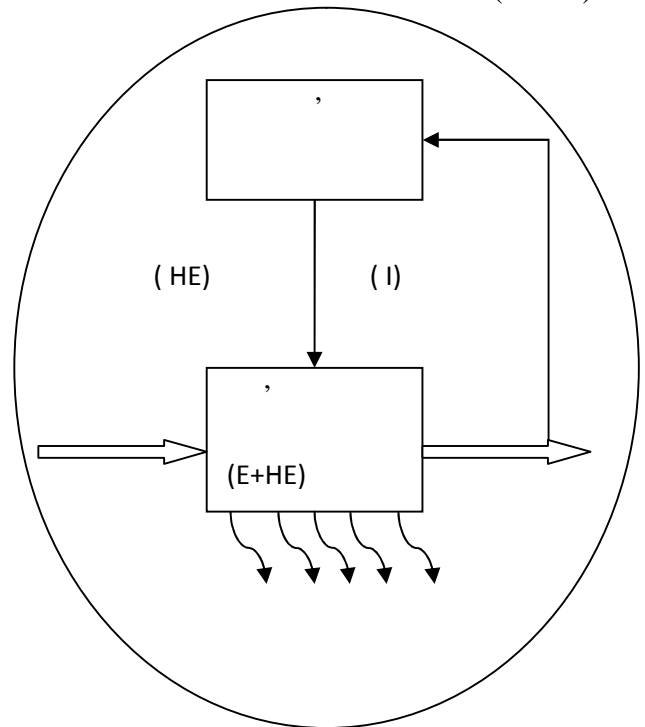
», « , , - , n  $p_i, i = 1, 2, 3 \dots$  , , (I) « - , (H),  $(\pm \Delta H)$  » [19].

$$\pm \Delta H = 0,$$

. 1, ( ), ( ) . 2, ( . 1) , , ( . 2).

, S , n,  $R(X) = \log n$  . (6)  $(+\Delta H)$ ,  $(-I)$ .

( .4).



.3.

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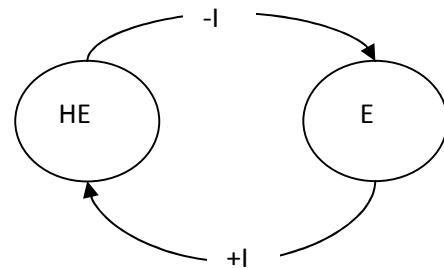
$$t = t_{-1} \pm \Delta I ; \quad (7)$$

$$\Delta = - \frac{-I}{\Delta I} ; \quad (8)$$

S (t-

1)

$\Delta I$

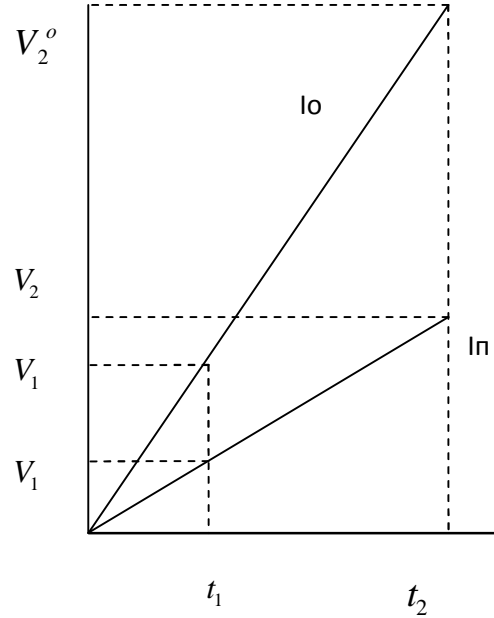


.4.

$$V = \frac{\Delta}{\Delta t} \quad V = \frac{\Delta}{\Delta t}.$$

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-   <	( ) -
-   =	.

$$H(t)_2 - H(t)_1 = \log \left[ \frac{\sqrt{2f\ell}}{\Delta t} \dagger_2 \right] - \log \left[ \frac{\sqrt{2f\ell}}{\Delta t} \dagger_1 \right] = \log \frac{\dagger_2}{\dagger_1}. \quad (10)$$



... ( ) ( ) ( . 5).

t1 t2.

$$; V_o = t_1 * I_o; V = t_1 * I$$

[3], :

$$H(t)_1 = \log \left[ \frac{\sqrt{2f\ell}}{\Delta t} \dagger_1 \right]. \quad (9) \quad (8)$$

V2

$$\dagger_1 < \dagger_2,$$

$$t_2 \quad t_1.$$

$$\Delta t_1 = \Delta t_2,$$

$$V E t_2 = \frac{\log \dagger_2 / \dagger_1}{t_2 - t_1}. \quad (11)$$

« ».

$$\dagger_1 = \frac{1}{6} (I * t_1 - I_o * t_1);$$

$$\dagger_2 = \frac{1}{6} (I * t_2 - I_o * t_2).$$



$$\frac{t_2}{t_1} = \frac{t_2}{t_1} \quad (9)$$

$$V_{E t_2}^{t_1} = \frac{\log t_2 / t_1}{t_2 - t_1} \quad (12)$$

( ),  
 > H  
 ( )

$$\Delta H = H - > 0,$$

$$p_1 < p_0,$$

$$t = \frac{1}{VE} \quad (13)$$

1. / // - 2011. - 3. - .46-61.
2. / // - 2002. - .75, .5. - .706-713.
3. / : , 1964. - 575 .
4. / // - 2008. - 44(10). - : <http://ej.kubagro.ru/a/viewant.asp?=762>
5. : [uk.wikipedia.org/wik/](http://uk.wikipedia.org/wik/)

6. <http://ideafix.nami/wp-content/uploads/stuff/SYSAN/9/pdf/>
7. <http://ideafix.nami/wp-content/uploads/stuff/SYSAN/9/pdf/>, 2012. – 184 p.
8. [vestnik.uapa.ru/en/issue/2012/04/10](http://vestnik.uapa.ru/en/issue/2012/04/10).
9. <http://www.nbu.gov.ua/e-Journals/nd/2005-1/05kvdiib.pdf>
10. [www.trinitas.ru/rus/dok/0016/001c/00161503.htm](http://www.trinitas.ru/rus/dok/0016/001c/00161503.htm)
11. [www.trinitas.ru/rus/dok/0016/001c/00161503.htm](http://www.trinitas.ru/rus/dok/0016/001c/00161503.htm), 2005. – 261 p.
12. [www.trinitas.ru/rus/dok/0016/001c/00161503.htm](http://www.trinitas.ru/rus/dok/0016/001c/00161503.htm), 2004. – 231 p.
13. [www.trinitas.ru/rus/dok/0016/001c/00161503.htm](http://www.trinitas.ru/rus/dok/0016/001c/00161503.htm)
14. [http://apolov-oleg.narod.ru/olderfiles/1/Prangishvili\\_I.V\\_Entropiinye\\_i\\_dr-88665.pdf](http://apolov-oleg.narod.ru/olderfiles/1/Prangishvili_I.V_Entropiinye_i_dr-88665.pdf)
15. Niepewno w teorii decyzji. – Mode of access: [Pl.wikipedia.org/wiki/Niepewno](http://pl.wikipedia.org/wiki/Niepewno)
16. Szkutnik Włodzimierz. System ekonomiczny a samoorganizacja – źródło niepewności w kontekście teorii systemu, stabilność i, różnorodność i kryzys / Szkutnik Włodzimierz ; Uniwersytet Ekonomiczny w Katowicach – Mode of access: [www.ue.katowice.pl/uploads/media/5\\_Włodzimierz\\_Szkutnik\\_System\\_ekonomiczny.pdf](http://www.ue.katowice.pl/uploads/media/5_Włodzimierz_Szkutnik_System_ekonomiczny.pdf).
17. Electronic resource. – Mode of access: <http://cis.legacy.ics.tkk.fi/papers/IJCNN99-tutorialweb/node14.html>.
18. Electronic resource. – Mode of access: <http://www.eoht.info/pege/Negentropy>.

## REFERENCES

1. Avdiyskiy V. I., Bezdenezhnykh V. M. *Neopredelennost', izmenchivost' i protivorechivost' v zadachakh analiza riskov povedeniya ekonomicheskikh sistem* [Uncertainty, variability and inconsistency for the analysis of risk behavior of economic systems]. *Effektivnoe antikrizisnoe upravlenie* – Effective crisis management. 2011, no. 3, pp. 46-61. (in Russian).
2. Aleskovskiy V. B. *Put' razrabotki tekhnologii ne vredyaschey prirode* [Technology development path is not harming nature]. *Zhurnal prikladnoy khimii* – Journal of Applied Chemistry. 2002, vol. 75, no. 5, pp. 706-713. (in Russian).
3. Ventsel' E. S. *Teoriya veroyatnostey* [Probability Theory]. Moscow, Nauka, 1964. 575 p. (in Russian).
4. Vyatkin V. B. *Sinergeticheskaya teoriya informatsii* [Synergetic information theory]. *Nauchnyy zhurnal KubGAU* – Scientific Journal KubGAU. 2008, no. 44(10). Available at: <http://ej.kubagro.ru/a/viewant.asp?762>. (in Russian).
5. *Informatsiya* [Information]. Available at: [uk.wikipedia.org/wiki/Informatsiya](http://uk.wikipedia.org/wiki/Informatsiya). (in Ukrainian).
6. *Informatsiya i samoorganizatsiya sistem* [Information and self-organizing systems]. Available at: [ideafix.nami/wp-content/uploads/stuff/SYSAN/9/pdf/](http://ideafix.nami/wp-content/uploads/stuff/SYSAN/9/pdf/). (in Russian).
7. Kuz'min E. A. *Neopredelennost' i opredelennost' v upravlenii organizatsionno-ekonomicheskimi sistemami* [Uncertainty and certainty in the management of organizational and economic systems]. Ekaterinburg, In-t ekonomiki UrO RAN, 2012. 184 p. (in Russian).
8. Kuz'min E. A. *Neviznachennost' v ekonomitsi, ponyattya ta polozhennya* [The uncertainty in the economy, the concept and conditions]. *Voprosy upravleniya* – Management issues. 2012, no. 4(21). Available at: [vestnik.uapa.ru/en/issue/2012/04/10](http://vestnik.uapa.ru/en/issue/2012/04/10). (in Ukrainian).
9. Kuchin V. D., Trofimenko O. L., Teodorovich I. V., Kirilenko O. B. *Entropiya negentropiyi printsipi informatsiy i v biologiyi* [Negentropic and entropy principles of information in biology]. *Naukov dopov d NAU* – Scientific report of NAU. 2005, no. 1(1). Available at: <http://www.nbu.gov.ua/e-Journals/nd/2005-1/05kvdiib.pdf>. (in Ukrainian).
10. Mlodetskiy V. R. *Upravlencheskaya realizuemost' stroitel'nykh projektov* [Managerial feasibility of building projects]. Dnepropetrovsk, Nauka osv ta, 2005. 261 p. (in Russian).
11. Sharapov O. D., Derbentsev V. D., Semyonov D. E. *Ekonomichna kibernetika* [Economic Cybernetics]. Kyiv, KNEU, 2004. 231 p. (in Ukrainian).
12. Popov V. P., Kraynyuchenko I. V. *Teoriya upravleniya i mify ob entropii* [Management theory and myths about entropy]. *Akademiya trinitarizma* – Academy of trinitarianism. Available at: [www.trinitas.ru/rus/dok/0016/001c/00161503.htm](http://www.trinitas.ru/rus/dok/0016/001c/00161503.htm). (in Russian).
13. Prangishvili I. V. *Entropiinye i drugie sistemnye zakonomernosti. Voprosy upravleniya slozhnyimi sistemami* [Entropy and other system laws. Issues of management of complex systems]. In-t problem upr. slozhnyimi

sistemami RAN. Available at: [http://apolov-oleg.narod.ru/olderfiles/1/Prangishvili\\_I.V\\_JEntropiinye\\_i\\_dr-88665.pdf](http://apolov-oleg.narod.ru/olderfiles/1/Prangishvili_I.V_JEntropiinye_i_dr-88665.pdf). (in Russian).

14. Niepewno w teorii decyzij. Available at: [Pl.wikipedia.org/wiki/Niepewno](http://pl.wikipedia.org/wiki/Niepewno)
15. Szkutnik Włodzimierz. System ekonomiczny a samoorganizacja – źródło nieowocowania w kontekście teorii systemu, stabilności, różnorodności i kryzysu. Uniwersytet Ekonomiczny w Katowicach. Available at: [www.ue.katowice.pl/uplads/media/5\\_Włodzimierz\\_Szkutnik\\_System\\_ekonomiczny.pdf](http://www.ue.katowice.pl/uplads/media/5_Wlodzimierz_Szkutnik_System_ekonomiczny.pdf).
16. Electronic resource. Available at: <http://cis.legacy.ics.tkk.fi/papers/IJCNN99-tutorialweb/node14.html>.
17. Electronic resource. Available at: <http://www.eoht.info/pege/Negentropy>.

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