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## A MATHEMATICAL FORMALIZATION OF MASLOW'S THEORY OF MOTIVATION

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A mathematical formalization of the well known theory of motivation proposed by Abraham Maslow can be given on a basis of the following equation:

$$M_i = C_i e^{\frac{D - A_{i-1}}{B_i - D}},$$
 (1)

 $M_i$  - partial motivation (generated by the *i*-th group of needs);

 $C_i$  - a constant;

D - total potential income;

 $A_i$  - threshold of satisfaction of the needs of the i-th level;

 $B_i$  - threshold of saturation of the needs of the *i*-th level. This value is equal to the total potential income that ensures the complete satisfaction of the needs of the *i*-th level so that they stop participating in this employee's motivation.

$$M = \Phi(M_1, M_2, \dots, M_n),$$

M - total motivation;

n - total number of levels of needs. Different versions of the Maslow's model include either 5 or 7 levels. For economical reasons,

$$M_{i} = \begin{cases} C_{i}e^{\frac{D-A_{i-1}}{B_{i}-D}}, & A_{i-1} \leq D \leq B_{i-1}, \\ 0, & D < A_{i-1}, D > B_{i}. \end{cases}$$
(2)

Using the modified Heavyside function Heav(x):

$$Heav(x) = \begin{cases} 0, & x \le 0, \\ 1, & x > 0. \end{cases}$$
(3)

So the formula (1) will look as follows:

$$M_{i} = C_{i} e^{\frac{D - A_{i-1}}{B_{i} - D}} \operatorname{Heav}(D - A_{i-1}) \operatorname{Heav}(B_{i} - D).$$
(4)

## REFERENCES

[1] A. G. Maslow. Motivacija i lichnost'. Evrazija, St. Petersburg, 1999 (translated from English).