

EVALUATION OF OBSOLETE OF KNOWLEDGE

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Abstract

In this paper a proposal for evaluating the knowledge (competence, possibility) of the company both for a specific job as well as the company as a whole is given. Knowledge with low grade are considered obsolete and outdate, and the best option (technology) is assumed to be the knowledge with greatest grade.

Keywords: knowledge, competence, possibility, organization.

INTRODUCTION

Since there are various definitions of the concept of knowledge in which we talk about data, information, and based on them there is defined the knowledge, it is necessary to clarify what is used to specify these terms in order to arrive at a definition of knowledge which allows knowledge to be measured [3].

To proceed we observe the definition of Brooking's [2] (see also [1]):

- data as fact, the very numbers-represented out of context,
- information as organized data presented in the context,
- knowledge as information in context, together with the manner of their use.

To arrive at the concept of knowledge suitable for the measurement, the paper [3] has given a different definition of these concepts based on Shannon's information theory.

The basic concept is the ultimate probabilistic system

$$\begin{pmatrix} x_1 & x_2 & \cdots & x_n \\ p_1 & p_2 & \cdots & p_n \end{pmatrix} \quad (1)$$

consisting of a finite set $X = \{x_1, x_2, \dots, x_n\}$ of so-called a set of states and their probability-the probability that the system can enter into the appropriate state (p_i is the probability that the system can be found in the state x_i).

The fact that the system X is in the state x_i , for the one who knows it, is a data. The same fact for the person who does not know is information at the moment of cognition. Shannon information theory was developed by measuring the information (amount) by the related probabilities.

In the paper [3], knowledge is defined as the possibility of transformation of a system X into a system Y .

System

$$X: \begin{pmatrix} x_1 & x_2 & \cdots & x_n \\ p(x_1) & p(x_2) & \cdots & p(x_n) \end{pmatrix} \quad (2)$$

is the input system, or the starting assumption of observation.

The system

$$Y: \begin{pmatrix} y_1 & y_2 & \cdots & y_m \\ p(y_1) & p(y_2) & \cdots & p(y_m) \end{pmatrix} \quad (3)$$

is in the output system consisting of the consequences of work.

In order to come into the output system and output probabilities it is necessary to know the transformation matrix

$$T = \begin{bmatrix} p(y_1|x_1) & p(y_2|x_1) & \cdots & p(y_m|x_1) \\ p(y_1|x_2) & p(y_2|x_2) & \cdots & p(y_m|x_2) \\ \vdots & \vdots & & \vdots \\ p(y_1|x_n) & p(y_2|x_n) & \cdots & p(y_m|x_n) \end{bmatrix} \quad (4)$$

This is the matrix of conditional probabilities, where $p(y_i|x_j)$ is the likelihood that starting from x_j we get y_i at the exit. It is clear, the following holds

$$\sum_{i=1}^m p(y_i|x_j) = 1, \quad (5)$$

and the relation

$$X \cdot T = Y \quad (6)$$

holds, also. Therefore, knowledge is a set of skills that the individual (organization) has to possess to obtain the output system from the initial system.

In [3] is defined desirability of output system Y :

$$\begin{pmatrix} y_1 & y_2 & \cdots & y_m \\ \alpha_1 & \alpha_2 & \cdots & \alpha_m \end{pmatrix}, \quad (7)$$

where the numbers α_i of desirability of the state y_i are determined from the perspective of those who translate the system X into the system Y , and holds $0 \leq \alpha_i \leq 1$, where $\alpha_i = 0$ is a sign that the state y_i is undesirable, and absolutely free $\alpha_i = 1$ is a sign that the state y_i is absolutely desirable. Also, there is defined the competence of the company (or an

individual) that translates the system X into the system Y , as the number

$$k(X, Y) = \sum_{j=1}^m p(y_j) \cdot \alpha_j \quad (8)$$

OUTDATE OF KNOWLEDGE AND ITS MEASUREMENT

At the same time, it may be possible to translate the input system

$$X: \begin{pmatrix} x_1 & x_2 & \cdots & x_n \\ p(x_1) & p(x_2) & \cdots & p(x_n) \end{pmatrix} \quad (9)$$

into an output system

$$Y: \begin{pmatrix} y_1 & y_2 & \cdots & y_m \\ p(y_1) & p(y_2) & \cdots & p(y_m) \end{pmatrix} \quad (10)$$

in several different ways, i.e. there exists the set $\{M_1, M_2, \dots, M_k\}$ of possibilities to starting with X one can get the output Y . Each of these possibilities is defined by its matrix of transformation

$$T_{M_i} = \begin{bmatrix} p^{(i)}(y_1|x_1) & p^{(i)}(y_2|x_1) & \cdots & p^{(i)}(y_m|x_1) \\ p^{(i)}(y_1|x_2) & p^{(i)}(y_2|x_2) & \cdots & p^{(i)}(y_m|x_2) \\ \vdots & \vdots & & \vdots \\ p^{(i)}(y_1|x_n) & p^{(i)}(y_2|x_n) & \cdots & p^{(i)}(y_m|x_n) \end{bmatrix}. \quad (11)$$

Since we are at the same time, desirability of output matrix is the same, and the output probability matrix is not, but for every M_i we have

$$Y: \begin{pmatrix} y_1 & y_2 & \cdots & y_m \\ p^{(i)}(y_1) & p^{(i)}(y_2) & \cdots & p^{(i)}(y_m) \end{pmatrix}, \quad (12)$$

which follows from

$$X \cdot T_{M_i} = Y_{M_i}. \quad (13)$$

In this way, we get for any possibility of a new competence

$$k(X, Y_{M_i}) = \sum_{j=1}^m p^{(i)}(y_j) \cdot \alpha_j. \quad (14)$$

It is obvious that the best option (technology), which starts from the system X and gives the output system Y is the one that have the greatest competence.

So, in this way we can mean that the knowledge (possibilities) that have the smallest competence are the outdated knowledge.

Remark 1: It is assumed that each individual in one (or more) associated system has exactly defined place and that through the probability of occurrence there is determined the size of his participation in competence.

Remark 2: Here, it is possible to view what is part of the «described knowledge» which represents the organization's intellectual capital, and which despite the difficulties, can be compensate with other perpetrators, and also what is part of the critical points.

CONCLUSION

This paper gives a proposal for evaluating the knowledge (competence, possibility) of the company or for a specific job either as a whole, based on assumptions that are taken for evaluation. It is suitable, in our opinion, to monitor the possible movement of labor, to exploit the advantages they may possess as the workforce of the company, but also for the identification of possible critical points that occur because of people moving to other companies or for retirement.

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