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Rethinking the Role of Organizational Reflex in Maintaining a Company's Sustainability

Sigitas Vaitkevicius [1], Ojaras Purvinis [2], Leonidas Sakalauskas [3] and Palmira Papsiene [4,*]

[1] Bioeconomy Research Institute, Vytautas Magnus University Agriculture Academy, Universiteto St. 11, LT-53361 Akademija, Lithuania; sigitas.vaitkevicius@gmail.com
[2] Panevezys Faculty of Technology and Business, Kaunas University of Technology, Nemuno St. 33, LT-37164 Panevezys, Lithuania; ojaras.purvinis@ktu.lt
[3] Department of Applied Informatics, Faculty of Informatics, Vytautas Magnus University, Vileikos St. 8, LT-44404 Kaunas, Lithuania; leonidas.sakalauskas@mif.vu.lt
[4] Department of Business and Rural Development Management, Faculty of Bioeconomy Development, Vytautas Magnus University Agriculture Academy, Universiteto St. 10, LT-53361 Akademija, Lithuania
* Correspondence: palmira.papsiene@gmail.com

Abstract: The organizational reflex in relation to the company is considered to be an instinctive reaction of its employees to an external stimulus that has arisen or, in other words, the ability of the employee to spontaneously generate a competitive response of the company based on the information received from the global environment. It is an intentional algorithm that enables employees to know how and when to react as quickly as possible, according to the signal from the global environment received, within the limits of their area of expertise. This response phenomenon comes forth in the context of the functioning of a sustainable organization and highlights the coherence of the performance of a human resource. In order to maintain its competitiveness, each organization learns to react to the ongoing changes in the dynamic environment as quickly as possible and, in this process, develops action algorithms similar to human reflexes in structure. Modern science makes a great contribution to the longevity of the company by creating activity models for the organization and performing simulations in the digital space. In this paper, the simulation model of a company's competitive human resource response to global changes, which is used for the description of organizational reflex, is present. The model reflects the human reflex arc in a company's decision-making process, whose effectiveness depends on the coherence of its human resources and its ability to sustain an effective organizational reflex. The purpose of the developed model is to simulate the employee's response to the signals incoming from the global environment and to describe the development process of the organizational reflex that is leading to the longevity of the company and the sustainability of its market leadership.

Keywords: organization management; sustainability; reflex; human resources

MSC: 93C95; 93A99

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1. Introduction

The review of organizations' sustainability literature [1–15] explored that sustainable development is important for organizations. The studies confirm the need for the economic, social, and ecological growth of organizations. However, there is a difference between preserving the environment and acting sustainably and the ability to sustain competition in the long term. Both of these, in the literature, are often described as contributing to a company's sustainability. This paper focuses on the company's ability to sustain competition over time.

Sustainability discourse analysis [1–9] and the review of the role of the organizational reflex [16,17] allowed the theoretical modeling of a system that examines the basics of

information received from the global environment in the company. This finding led to the development of a concept describing the ability of a company to maintain its competitiveness in the long term and to secure its longevity. This concept covers the main areas of sustainability and describes the essential principles that are needed for companies to outgrow time and ensure their survival. Earlier, Klimek & Jedrych [18] presented the concept of sustainable management of enterprise capital that grant companies longevity from a financial perspective. Lozano [7] noted that organizations better prepare for challenges where human resource activity and cooperation will ensure sustainable performance in the company. The provisions of human resource management must be consistent with the ones of a sustainable organization, which elevates sustainability within the company and allows the company to exist in a competitive environment. The flow of information from the global environment to the inside of the company affects the sustainability of the company, and the beliefs and behaviors of human resources allow the company to manipulate them to increase the stability of sustainability. Wijethilake & Lama [3] point out that a sustainable organization is responsible and committed to acting sustainably, e.g., to preserve the natural environment, which gives a competitive advantage. As noted by Evans et al. [10], sustainable value includes economic, social, and environmental benefits that enable innovation in the interest of stakeholders.

Organizational reflex analysis revealed that companies, like humans, form their reflex, which is needed to operate effectively and timely to respond to signals incoming from the outer environment. Previous studies [16,17] show that companies form their reflexes based on the inner interaction of human recourses. In a company, the interaction between human resources replicates the human reflex arc, which can be explained by the biological theory of organization [19–21]. This led to the insight that companies not only operate based on the main principles of sustainability in the global environment in order to preserve the operating environment but also depend on the evolution of their human nature, which is intertwined with the environment and evolves in response to it.

On the basis of theoretical analysis, it has been revealed that organizational reflex in a company is fundamentally possible since a sustainable organization is capable of overcoming many challenges in a competitive environment to avoid failures and ensure sustainability with the help of human resources in managing the information flows coming from the global environment.

The goal of this research was to develop a theoretical model that would reflect the response of a sustainable organization to signals received from the global environment.

In terms of research methods, theoretical modeling is based on analogy, analysis of the human reflex arc, and the organization's response to signals from the global environment.

2. Effective Human Resource Management as a Guarantor of a Sustainable Organization

The constantly evolving and changing global environment requires a new approach to human resource management. Progressive change involves human resources, which become a key factor in ensuring the efficiency and performance of the organization's sustainability goals and provides flexibility to respond more quickly to change processes.

Research is carried out by going deep into the current situation of human resources management, conditions of their capabilities, and operational prospects in the processes of progress [22]. The need of the individual to manage himself as a human resource is also confirmed by Lei & Jia [23]. The authors argue that individuals mainly feel the benefits of investing in their human resources by getting a better chance of getting a better job. Acquired knowledge increases their labor productivity and, therefore, wages. According to Lei & Jia [23], a contribution to human capital is considered an investment when a company invests in the training and development of talent and technologies that provide a competitive advantage. As with investing in physical capital, a company that maximizes its assets will only invest with the expectation that the return will exceed the market value of the investment. It should be noted here that despite the argument of creating value for the individual expressed by

the authors, the essence of which is the value created by the company for the individual, nevertheless the statement that this is valid only provided that the company sees the possibility of return, leaves room for the employee's self-motivation when not the company but the employee is interested in the creation of that benefit. Here, the motivation to climb the career ladder or to change established conditions often plays a big role [24]. For example, some stereotypes can be presented: (1) "if a person is a highly-qualified employee and can offer himself to the organization as an employee who creates high added value, then their employment opportunities will always be higher than those who do not have professional training, are less qualified, or do not have work experience", (2) "a person with higher education is less likely to solve the problem of unemployment" [23]. Although these stereotypes under certain conditions are confirmed in the scientific literature, there are cases when they are not valid. For example, there are cases when a company does not need such a highly-qualified employee. It has foreseen a lower-qualified employee in a particular workplace because it has been proven in the past, and it does not matter that ultimately, it is likely that the employee would agree to the proposed lower price of the company, but it is very likely that the company, having assessed its experience (satisfied with the lower qualification), need (we do not plan to need a higher one), and opportunities (planned to pay for the lower qualification), will not even invite the potential employee for an interview. It is in such cases that the individual self-determination function of human resource management can help. Although in some cases, the self-determination of the individual does not help them because the company has such a policy towards employees (which is divided into certain criteria acceptable to the company). For example, a hypothetical situation could involve how one of the sustainability factors of Company A is affected by a competitor (Company B); destabilization of sustainability occurs, but Company A restores sustainability stability by applying the unconditional reflex effect.

Suppose that there is an already-established Company A in the market, which carries out Activity a. Company A receives information from the global environment that Company B is developing in the same region, which will carry out Activity b. Activity b is the same as Activity a (e.g., services). One of the possible strategic goals of company B is to recruit experienced employees (to save funds for employee training, etc.). In Company A, there is a conditional reflex; that is, the Organizational Brain considers various alternatives that Company B will use when it starts to implement its recruitment intentions.

The Organizational Brain of Company A makes a decision/anticipates a possible decision that Company B will entice employees with a higher reward or something similar to what employees in Company A currently receive. The Organizational Brain of Company A assesses the current situation and financial capacity and decides to increase salaries (when the time comes) at least a little more than Company B will offer to them. It also assesses the fact that the employee who has been working in Company A for a long time will not want to change the company, because everything is satisfactory there, the employee feels good morally, safety is ensured, the salary is even 1% higher than what the Company B will offer. Also, the Organizational Brain of Company A makes the decision, taking into account the material side, that this salary increase will be applied only to employees who are attractive in the labor market by their age. Employees who will end their careers soon are not attractive in the labor market (the self-determination function of the individual does not work) and expect that Company B will not invite them. Company A will try to save the most attractive employees. In this way, Company A developed an unconditioned reflex response to the predicted destabilization of sustainability after the attacks of Company B. The change in sustainability is shown in Figure 1. This situation shows how Company A transformed the conditioned reflex into the unconditioned reflex and, in time, stabilized the sustainability of the company after the attack by the competing Company B.

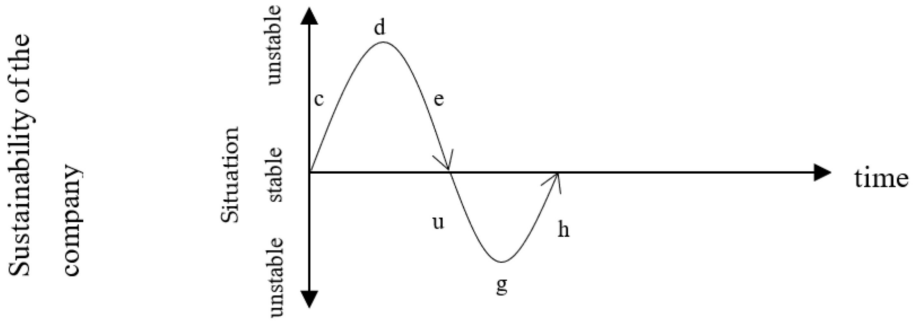

Figure 1. Possible changes in Company A's sustainability after attacks by Company B. c: part of the curve shows how the sustainability of Company A changes after attacks by Company B; that is, after employees of Company A receive commercial offers from Company B, sustainability decreases as employees want to move to Company B; d: in Company A, there is an unconditional reflex to attack Company B (this is a pre-developed response option), and the sustainability situation is critical; e: a result of the pre-prepared response of Company A, the sustainability returns to a state of stability; u: employees, who will soon end their careers and already are less attractive in the labor market, dissatisfaction is growing with their salaries not increasing, the sustainability is decreasing; g: the critical position of the sustainability of a specific case; h: employees have no choice and accept the current situation, the sustainability returns to a stable position, and they continue to work.

Ongoing socioeconomic development has led to many changes in the external and internal environment of companies. The increasing demands of society on the employees of companies directly determine the effectiveness and efficiency of the implementation of socioeconomic decisions. The competencies, skills, abilities, and knowledge of the staff of the company are of great importance for solving these problems, so human resources become an important value in a sustainable organization [25–30]. A sustainable organization must integrate the learning process into its constantly changing environment, which will allow human resources to achieve their goals in the best conditions, which will ensure the effectiveness of the company and changes in the environment. Therefore, it is very important to stimulate a positive attitude towards the activities and behavior of the company among human resources, as it guarantees the sustainability of the company.

A sustainable organization focuses on human resources, qualifications that depend on the company's effective ability to respond to information from the global environment promptly, and making responsible decisions that will give the company maximum benefits or ensure minimal losses. A sustainable organization is like a physical model of artificial intelligence, where effective work is sought, and each effective decision-making is achieved only by learning and accumulating knowledge, which is then used to achieve a company's competitiveness.

Information that is received from the global environment in a sustainable organization is analyzed by human resources. Therefore, it is important to understand that human resources should have an advanced way of thinking reflecting the sustainability principles and enabling the answer which information to process and which to reject, as mismatching the competitiveness. In the company, through the sustainability dimension, the actualization of social, economic, environmental, and time factors is revealed, in which the initial assessment of these factors takes place according to the experiential database (EDB) accumulated in the company. If information about sustainability factors accumulated in EDB satisfies at this particular moment to form a response, then unconditional sustainability reflex ensuring the sustainability of the company occurs. If information from these four factors is insufficient, then, in this case, creativity in the company occurs. The result obtained during the creative process for a specific sustainability factor is placed in the EDB. Primary reflex responses are ineffective, and the company loses time. When learning takes place in the company, in this particular case, sustainability-supporting reflexes are created, which will be used in the repetition of a similar situation, and time will be saved for decision-making. In the long term, the company develops a long-term sustainability

competence. In each new case of conditioned reflex, when the company creates response actions, the company's EDB is replenished with new knowledge. In the EDB, the following possible directions are formed accordingly according to the results obtained. A situation may arise in the company that the response will not be broadcast due to unfavorable competitive conditions. Although in this case, the sustainability reflex response has not been broadcast, as the information is still stored in the EDB.

3. The Role of the Organizational Reflex in a Sustainable Organization

A company is a complex system consisting of many structural elements in unified contact with the internal and external environment, which constantly acts and actively responds to changes in the environment. The ability to respond to changes in the environment distinguishes the company from the whole, forces the company to maintain its type, and forms the process of evolution of the company: signal, reaction, and response. Similarly, in the case of the human nervous system, where the brain consists of about 100 billion neurons and about 100 trillion synapses, a network of chemical messages is formed from these elements and is the basis of all human thoughts, physical activity, and emotions [31]. According to Gavin [32], the company must be seen as a system of interconnected parts, similar to the human body, because each part of the body depends on the others. The biological foundations of organizational behavior have been analyzed in detail [33]. The mathematical model of the brain and mental activity in reflection was considered by [34] as well.

Reflex memorization pattern (see Figure 1), in a broad sense, means the signal sent by the global environment to the company and the company's response to it. With the help of the organizational reflex, the company responds promptly to various changes in the environment and adapts to them, which increases the sense of security for employees and reduces the stress caused by uncertainty. Just by definition, it can be stated that with the help of a reflex, the company responds to external stimuli. Since the company has been studied from the perspective of its organizational reflex, therefore, the receptor that affects the company in the compiled model represents the reaction of the signal sent from the global environment to it. Meanwhile, the effector forms the company's response to the global environment. The receptor always reacts when irritated, but the response is not always developed.

During the formation of the reflex memorization model, it was noticed that the principles of operation of the reactivity system of the company could be explained with the help of the human reflex arc. A typical reflex arc consists of five components: 1. Receptor: branched outgrowths of a sensory neuron located in the skin, tendons, joints or other peripheral organs; 2. Sensory neuron: extending from the receptor through the dorsal (posterior) root, the sensory neuron transmits stimuli to the dorsal (posterior) horn of the spinal cord. 3. Center: the axon of the sensory neuron connects to the associative neuron in the H-shaped gray matter of the spinal cord. 4. Motor neuron: starting from the synapse with the associated neuron, the motor neuron transmits impulses from the anterior horn of the spinal cord through the anterior root to the responsive organ. 5. Effector (response organ): muscle or gland, which responds accordingly to the motor impulse by contracting or secreting.

During the comparison, the essential elements of the nervous system: sensors, effectors, spinal nerves, and the brain as a system were extrapolated to the pattern of memorization of reflexes. The result of this extrapolation is a model of organization reflex formation and memorization, where the receptor and effector realize changes in the company, which acts as a receiver and transmitter of signals from the global environment. The functioning of the spinal cord describes the structure of the internal environment, while the brain describes the data processing and decisions that take place in the company and the response signal sent to the global environment.

A description of the structural schemes of the reflex formation and memorization model is presented in Figure 2.

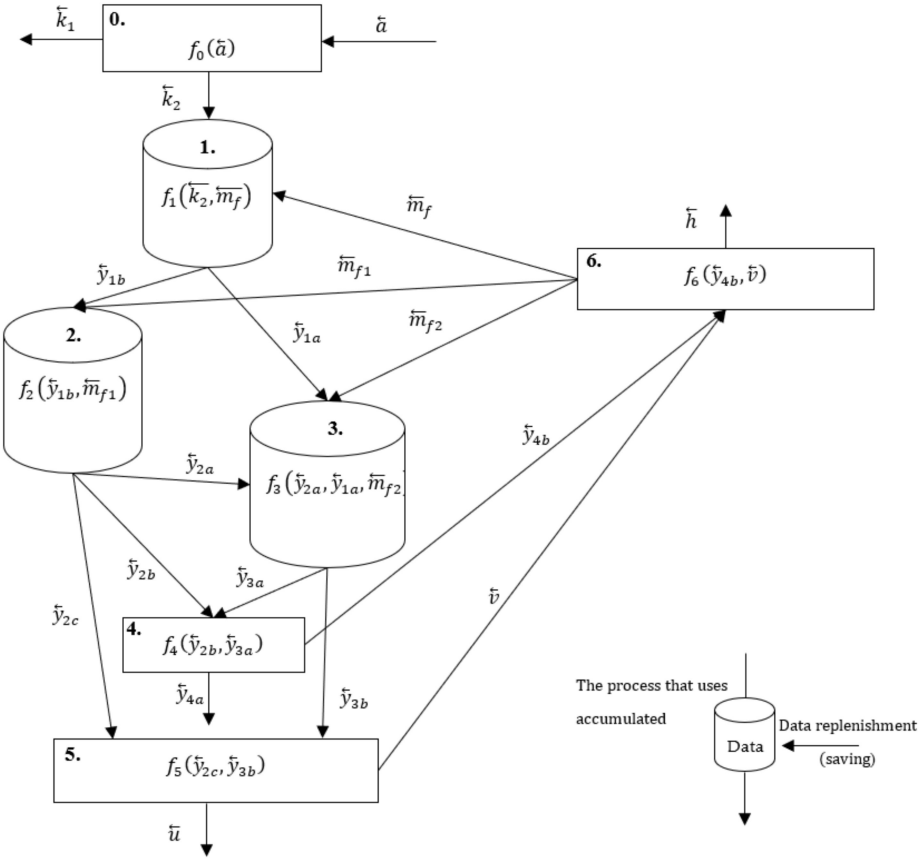

Figure 2. Reflex formation and memorization model. 1. Information filter of experiential DB (*b*, *c*,..., *n*); 2. DB of unconditioned reflex arc; 3. Experiential DB of the conditioned reflex arc.

3.1. Functional Description of the Model for Blocks

#0. Information actualization rejection/acceptance;
#1. Systematization and preparation of information for processing;
#2. Information processing (routine process);
#3. Information processing (creative process);
#4. Processing of unused information (rethinking);
#5. Sequencing of competitive response actions;
#6. Response execution and instruction to remember.

3.2. Description of Model Signal Direction

$\overleftarrow{a}$: information from the global environment;
$\overleftarrow{k}_1$: not recorded (0);
$\overleftarrow{k}_2$: record and initiate the processing process according to criteria a, b, ... *n*;
b: filter. Source of information (official/unofficial);
c: filter. Status of information (written/oral);
n: other possible criteria of information systematization for processing;
$\overleftarrow{y}_{1a}$: a thinking-based solution is needed (creative decision-making process);
$\overleftarrow{y}_{1b}$: automatic decision-making based on a previously formed unconditioned reflex (routine decision-making process);
$\overleftarrow{y}_{2a}$: during the routine process, it became clear that decision-making based on thinking is required;
$\overleftarrow{y}_{2b}$: during the routine process, information not used to form a response is rejected;
$\overleftarrow{y}_{2c}$: information prepared during the routine process to form a competitive response;

$\overleftarrow{y}_{3a}$: during the creative process, information not used to form a response is rejected;
$\overleftarrow{y}_{3b}$: information prepared during the creative process for the formation of a competitive response;
$\overleftarrow{y}_{4a}$: forgetfulness of rejected information (0);
$\overleftarrow{y}_{4b}$: saving unused relevant information for the future;
$\overleftarrow{u}$: response position result (non-response task; 0);
$\overleftarrow{v}$: response position result (task to act);
$\overleftarrow{m}_f$: placing information in the company's experiential database (filter development/improvement);
$\overleftarrow{m}_{f1}$: replenishment of the unconditioned reflex arc with a memorized behavioral model (improvement of routine behavior);
$\overleftarrow{m}_{f2}$: replenishment of the conditioned reflex arc by memorized experience (efficiency of thinking and its process);
$\overleftarrow{h}$: response to the global environment signal.

3.3. Algorithm of Model Signal Direction

Information $\overleftarrow{a}$ from the global environment enters block #0 (information actualization rejection/acceptance) in which the initial assessment takes place; accordingly, the following possible directions are formed according to the result obtained:

- If information $\overleftarrow{a}$ does not meet the primary requirements, block #0 generates a direction $\overleftarrow{k}_1$ in the 0-line value, that is (not record) information $\overleftarrow{a}$;
- If information $\overleftarrow{a}$ meets primary requirements, it generates direction $\overleftarrow{k}_2$, where the result of pre-processing is redirected to block #1;
- In block #1 (systematization and preparation of information for processing), information $\overleftarrow{k}_2$ is processed, its informativeness/fullness is evaluated according to DB, which is characteristic only for block #1 and, accordingly, the following possible directions are formed according to the result obtained:
- If received information $\overleftarrow{k}_2$ manages to be systematized according to the available DB, there is formed a direction $\overleftarrow{y}_{1b}$ to block #2;
- If the information received $\overleftarrow{k}_2$ cannot be systematized according to the available DB, a direction $\overleftarrow{y}_{1a}$ is formed to block #3;
- When block #2 (information processing/routine process) receives information $\overleftarrow{y}_{1b}$, it is analyzed and processed, and accordingly, the following possible directions are formed according to the result obtained:
- If the received information $\overleftarrow{k}_2$ is informative/full, corresponding to the conditions of the organization's activities, there is a formed direction $\overleftarrow{y}_{2c}$ to block #5;
- If the received information $\overleftarrow{k}_2$ is informative/full, does not meet the operating conditions of the organization, there is a formed direction $\overleftarrow{y}_{2b}$ to block #4;
- If received information $\overleftarrow{k}_2$ is non-informative/incomplete, there is a formed direction $\overleftarrow{y}_{2a}$ to block #3;
- When block #3 (information processing/creative process) receives information $\overleftarrow{y}_{1a}$, this information reaches the features of block #1 DB < 100%. If information is received $\overleftarrow{y}_{2a}$, features of block #2 DB reach <100%. In the general case, this indicates the incompleteness of information, and according to the informative features they have (addition/recovery) according to the available DB, characteristic only for block #3, the directions of the next are formed according to the result obtained:

- Direction $\overleftarrow{y}_{3a}$ is the result of artificially formed information, that is, restored/supplemented, according to the available DB of block #3, and the result obtained does not correspond to the conditions of the organization's activities, is directed to block #4;
- Direction $\overleftarrow{y}_{3b}$ is the result of artificially formed information, that is, restored/supplemented, according to the available DB of block #3 and the result corresponding to the operating conditions of the organization is directed to block #5;
- After receiving information $\overleftarrow{y}_{3a}$ or $\overleftarrow{y}_{2b}$, block #4 (processing of unused information) evaluates it and shapes it in signal directions according to the result obtained:
- Direction $\overleftarrow{y}_{4a}$, information is useless at 100%, 0-line value $\overleftarrow{y}_{4a}$ is generated;
- Direction $\overleftarrow{y}_{4b}$, information is useless < 100%, to block #6;
- Information in the directions $\overleftarrow{y}_{2c}$ or $\overleftarrow{y}_{3b}$ entering block #5 (sequencing of competitive response actions) is analyzed and forms the following actions according to the obtained result:
- Direction $\overleftarrow{u}$ is formed by the value 0 to not react;
- Direction $\overleftarrow{v}$ is formed by value 1 to act, a command is sent to block #6;
- Received information from directions $\overleftarrow{v}$ or $\overleftarrow{y}_{4b}$ in block #6 (response execution and instruction to memorize) is analyzed, and the following response signals are generated according to the result obtained:
- In the direction $\overleftarrow{m}_f$ the signal indicates to supplement DB of block #1 with new information;
- In the direction $\overleftarrow{m}_{f1}$ the signal indicates to supplement DB of block #2 with information;
- In the direction $\overleftarrow{m}_{f2}$ the signal indicates to supplement DB of block #3 with new information;
- In the direction $\overleftarrow{h}$ a response signal to the global environment is formed;
- (0): process completed;
- $\overleftarrow{m}_n$: organizational experiential learning.

4. Mathematical Concept of the Model

Each block of the structural scheme (see Figure 2) is mathematically described with the help of a vector function with a corresponding number. For example, a function that corresponds to the block with a number i is marked $f_i()$.

Since the input of information actualization rejection/acceptance (see block #0) is marked with variable $\overleftarrow{a}$, and the outputs are $\overleftarrow{k}_1$ and $\overleftarrow{k}_2$, therefore, it can be modeled by a vector function:

$$\left(\overleftarrow{k}_1, \overleftarrow{k}_2\right) = f_o\left(\overleftarrow{a}\right), \tag{1}$$

with one argument $\overleftarrow{a}$, where

$$f_0\left(\overleftarrow{a}\right) = \Theta(\alpha_{20} - \alpha)\Theta(\alpha - \alpha_{10}). \tag{2}$$

In informatics terms, this function can be calculated by the following Algorithm 1

Algorithm 1: Calculating values of $f_o\left(\overleftarrow{a}\right)$.

1: **If** $\overleftarrow{a}$ meets primary requirements **then**
2: $\overleftarrow{k}_1 = void$
3: $\overleftarrow{k}_2 = \overleftarrow{a}$
4: **Else**
5: $\overleftarrow{k}_1 = 0 \times \overleftarrow{a}$
6: $\overleftarrow{k}_2 = void$
7: **end if**

which can be implemented in any programming language.

Here *void* is a keyword used in programming to mean a variable that has no information, and $0 \times \overleftarrow{a}$ is used to mark the non-recording of information, i.e., forgetting.

It is also possible to model this block with a perceptron used in artificial neural networks.

Here $n(\overleftarrow{a})$ is information $\overleftarrow{a}$ in compliance with the requirements, expressed in points, and φ is an activation function [35] generating $\overleftarrow{k}_1$, if the value of $n\left(\overleftarrow{a}\right)$ is less than the minimum compliance n_0, and generating $\overleftarrow{k}_2$ otherwise. The model is easy to extend in neutrosophic logic as well [36].

Let us consider one of the possible analytical implementations of the structural scheme given in Figure 3.

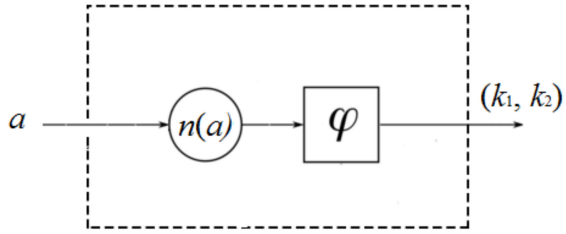

Figure 3. Sketch of the structural scheme of the perceptron.

Suppose the information $\overleftarrow{a}$ is the sum of $\alpha_1 + \alpha_2$, two components α_1 and α_2, which are expressed as numeric scores, and the requirements are $\alpha_1 > \alpha_{10}$ and $\alpha_2 > \alpha_{20}$.

The information compliance function then can be expressed as

This is example 2 of an equation:

$$n\left(\overleftarrow{a}\right) = (\alpha_1 + \alpha_2)\Theta(\alpha_1 - \alpha_{10})\Theta(\alpha_2 - \alpha_{20}) \tag{3}$$

where the Heaviside function

$$\Theta(\alpha - \alpha_0) = \begin{cases} 1, & if\ \alpha - \alpha_0 > 0 \\ 0 & otherwise \end{cases} \tag{4}$$

Therefore, $n(\overleftarrow{a}) = \alpha_1 + \alpha_2$ when the information components (α_1, α_2) meet both requirements $\alpha_1 > \alpha_{10}$ and $\alpha_2 > \alpha_{20}$, otherwise $n(\overleftarrow{a}) = 0$.

For instance, when $\alpha_{10} = 10$ and $\alpha_{20} = 15$ then the plot of $n(\overleftarrow{a})$ is given in Figure 4.

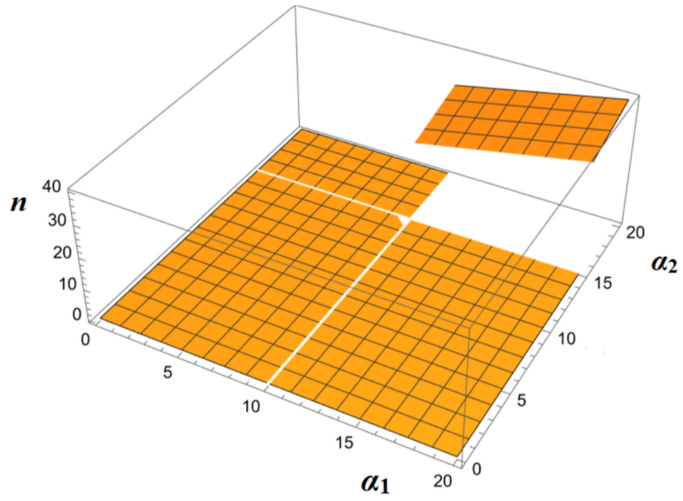

Figure 4. Plot of the information compliance function $n(\overleftarrow{a})$.

Let us take one of the most simple sigmoid activation function

$$\varphi = \varphi(n - n_0) = \frac{1}{1 + e^{-(n-n_0)}} \tag{5}$$

which is shown in Figure 5.

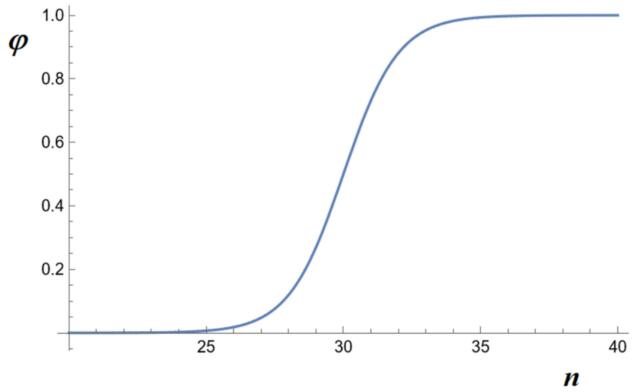

Figure 5. Plot of the sigmoid activation function $\varphi(n - n_0)$ when $n_0 = 30$.

Therefore, the outputs $\overleftarrow{k}_1$ and $\overleftarrow{k}_2$ can be expressed

$$\overleftarrow{k}_i = k_{i\,max}\varphi(w_i\,(n - n_0)),\ i = 1,\ 2, \tag{6}$$

where $k_{i\,max}$ is the maximal value of the output $\overleftarrow{k}_i$ and the weight wi specifies the steepness of the curve at point n_0.

Substituting the expression of $n\left(\overleftarrow{a}\right)$ into the sigmoid function and into expressions of k_i, we obtain the model of the entire block #0 given in Figure 3

$$\overleftarrow{k}_i = \frac{k_{i\,max}}{1 + e^{-wi(\,(\alpha_1+\alpha_2)\Theta(\alpha_1-\alpha_{10})\Theta(\alpha_2-\alpha_{20})-n_0),}},\ i = 1, 2. \tag{7}$$

The mathematical model of systematization and preparation of information for processing (see block #1) can also be expressed similarly using a vector function with two arguments

$$\left(\overleftarrow{y}_{1a}, \overleftarrow{y}_{1b}\right) = f_1\left(\overleftarrow{k}_2, \overleftarrow{m}_f\right) \tag{8}$$

where

$$\overleftarrow{y}_{1a} = f_{1a}\left(\overleftarrow{k}_2, \overleftarrow{m}_f\right) = \Theta\left(\overleftarrow{k}_2 - \overleftarrow{k}_{20}\right)\Theta\left(\overleftarrow{k}_{21} - \overleftarrow{k}_2\right)\left(1 - \Theta\left(\overleftarrow{m}_f\right)\right),$$
$$\overleftarrow{y}_{1b} = f_{1b}\left(\overleftarrow{k}_2, \overleftarrow{m}_f\right) = \left(1 - \Theta\left(\overleftarrow{k}_2 - \overleftarrow{k}_{20}\right)\Theta\left(\overleftarrow{k}_{21} - \overleftarrow{k}_2\right)\right)\Theta\left(\overleftarrow{m}_f\right)).$$

The function $\overleftarrow{y}_{1a}$ takes a value of 1, which is a decision to process information creatively, and takes a value of 0 otherwise. In this case, the block gets $\overleftarrow{k}_2$ values between $\overleftarrow{k}_{20}$ and $\overleftarrow{k}_{21}$ and $\overleftarrow{m}_f = 0$.

Example 1. *For instance, if* $\overleftarrow{k}_2 = 2.4$, $\overleftarrow{k}_{20} = 2$, $\overleftarrow{k}_{21} = 3$, *and* $\overleftarrow{m}_f = 0$ *then*

$$\overleftarrow{y}_{1a} = f_{1a}\left(\overleftarrow{k}_2, \overleftarrow{m}_f\right) = \Theta(2.4 - 2)\Theta(3 - 2.4)(1 - \Theta(0)) = 1 * 1 * 1 = 1.$$

The function $\overleftarrow{y}_{1b}$ *takes a value of 1, which is a decision to process information routinely, and takes a value of 0 otherwise. In this case, the block gets* $\overleftarrow{k}_2$ *values outside the interval* $\left[\overleftarrow{k}_{20},\ \overleftarrow{k}_{21}\right]$ *and* $\overleftarrow{m}_f = 1$.

Realization of this mathematical model, like the other models below, can be accomplished by analogy with software.

Similarly, mathematical models of other blocks can be written.

The mathematical model of information processing (routine process; see block #2) can be similarly written as a vector function with two arguments

$$\left(\overleftarrow{y}_{2a}, \overleftarrow{y}_{2b}, \overleftarrow{y}_{2c}\right) = f_2\left(\overleftarrow{y}_{1b}, \overleftarrow{m}_{f1}\right) \tag{9}$$

where

$$\begin{gathered}\overleftarrow{y}_{2a} = f_{2a}\left(\overleftarrow{y}_{1b}, \overleftarrow{m}_{f1}\right) = \Theta\left(\overleftarrow{y}_{1b}\right)\Theta\left(\overleftarrow{m}_{f1} - \overleftarrow{m}_{f10}\right)\Theta\left(\overleftarrow{m}_{f11} - \overleftarrow{m}_{f1}\right),\\ \overleftarrow{y}_{2b} = f_{2b}\left(\overleftarrow{y}_{1b}, \overleftarrow{m}_{f1}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{1b}\right)\right)\Theta\left(\overleftarrow{m}_{f10} - \overleftarrow{m}_{f1}\right),\\ \overleftarrow{y}_{2c} = f_{2c}\left(\overleftarrow{y}_{1b}, \overleftarrow{m}_{f1}\right) = \Theta\left(\overleftarrow{y}_{1b}\right)\Theta\left(\overleftarrow{m}_{f1} - \overleftarrow{m}_{f11}\right).\end{gathered}$$

values $\overleftarrow{m}_{f10}$, $\overleftarrow{m}_{f11}$ are parameters specific to the process, and they split the interval [0, 1] of $\overleftarrow{m}_{f1}$ values into three parts [0, $\overleftarrow{m}_{f10}$], [$\overleftarrow{m}_{f10}$, $\overleftarrow{m}_{f11}$] and [$\overleftarrow{m}_{f11}$, 1].

The function $\overleftarrow{y}_{2a}$ takes value 1, which is a decision to process information creatively, and takes a value of 0 otherwise.

The mathematical model of information processing (creative process; see block #3) is also written with a vector function with three arguments

$$\left(\overleftarrow{y}_{3a}, \overleftarrow{y}_{3b}\right) = f_3\left(\overleftarrow{y}_{1a}, \overleftarrow{y}_{2a}, \overleftarrow{m}_{f2}\right) \tag{10}$$

where

$$\begin{gathered}\overleftarrow{y}_{3a} = f_{3a}\left(\overleftarrow{y}_{1a}, \overleftarrow{y}_{2a}\overleftarrow{m}_{f2}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{1a} - \overleftarrow{y}_{1a0}\right)\Theta\left(\overleftarrow{y}_{1a1} - \overleftarrow{y}_{1a}\right)\right)\Theta\left(\overleftarrow{m}_{f2}\right),\\ \overleftarrow{y}_{3b} = f_{3b}\left(\overleftarrow{y}_{1a}, \overleftarrow{y}_{2a}\overleftarrow{m}_{f2}\right) = \Theta\left(\overleftarrow{y}_{2a} - \overleftarrow{y}_{2a0}\right)\Theta\left(\overleftarrow{y}_{2a1} - \overleftarrow{y}_{2a}\right)\left(1 - \Theta\left(\overleftarrow{m}_{f2}\right)\right).\end{gathered}$$

The mathematical model of processing unused information (rethinking; see block #4) is written with a vector function with two arguments

$$\left(\overleftarrow{y}_{4a}, \overleftarrow{y}_{4b}\right) = f_4\left(\overleftarrow{y}_{2b}, \overleftarrow{y}_{3a}\right) \tag{11}$$

where

$$\begin{gathered}\overleftarrow{y}_{4a} = f_{4a}\left(\overleftarrow{y}_{2b}, \overleftarrow{y}_{3a}\right) = \Theta\left(\overleftarrow{y}_{2b} - \overleftarrow{y}_{2b0}\right)\Theta\left(\overleftarrow{y}_{2b1} - \overleftarrow{y}_{2b}\right)\left(1 - \Theta\left(\overleftarrow{m}_{f2}\right)\right),\\ \overleftarrow{y}_{4b} = f_{4b}\left(\overleftarrow{y}_{2b}, \overleftarrow{y}_{3a}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{2b} - \overleftarrow{y}_{2b0}\right)\Theta\left(\overleftarrow{y}_{2b1} - \overleftarrow{y}_{2b}\right)\right)\Theta\left(\overleftarrow{m}_{f2}\right).\end{gathered}$$

The mathematical model of sequencing of competitive response actions (see block #5) is written with a vector function with two arguments

$$\left(\overleftarrow{u}, \overleftarrow{v}\right) = f_5\left(\overleftarrow{y}_{2c}, \overleftarrow{y}_{3b}\right) \tag{12}$$

where

$$\begin{gathered}\overleftarrow{u} = f_u\left(\overleftarrow{y}_{2c}, \overleftarrow{y}_{3b}\right) = \Theta\left(\overleftarrow{y}_{2c} - \overleftarrow{y}_{2c0}\right)\Theta\left(\overleftarrow{y}_{2c1} - \overleftarrow{y}_{2c}\right)\left(1 - \Theta\left(\overleftarrow{m}_{f2}\right)\right),\\ \overleftarrow{v} = f_v\left(\overleftarrow{y}_{2c}, \overleftarrow{y}_{3b}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{2c} - \overleftarrow{y}_{2b0}\right)\Theta\left(\overleftarrow{y}_{2c1} - \overleftarrow{y}_{2c}\right)\right)\Theta\left(\overleftarrow{m}_{f2}\right).\end{gathered}$$

The mathematical model of response execution and instruction to remember (see block #6) is written with a vector function with two arguments

$$\left(\overleftarrow{m}_{f1}, \overleftarrow{m}_{f2}, \overleftarrow{m}_{f,} \overleftarrow{h}\right) = f_6\left(\overleftarrow{y}_{4b,} \overleftarrow{v}\right) \tag{13}$$

where

$$\begin{aligned}
\overleftarrow{m}_{f1} &= f_{f1}\left(\overleftarrow{y}_{4b}, \overleftarrow{v}\right) = \Theta\left(\overleftarrow{y}_{4b}\right)\Theta\left(\overleftarrow{v} - \overleftarrow{v}_0\right)\Theta\left(\overleftarrow{v}_1 - \overleftarrow{v}\right),\\
\overleftarrow{m}_{f2} &= f_{f2}\left(\overleftarrow{y}_{4b}, \overleftarrow{v}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{4b}\right)\right)\Theta\left(\overleftarrow{v}_0 - \overleftarrow{v}\right),\\
\overleftarrow{m}_{f} &= f_{f}\left(\overleftarrow{y}_{4b}, \overleftarrow{v}\right) = \left(1 - \Theta\left(\overleftarrow{y}_{4b}\right)\right)\Theta\left(\overleftarrow{v}\right),\\
\overleftarrow{h} &= f_{h}\left(\overleftarrow{y}_{4b}, \overleftarrow{v}\right) = \Theta\left(\overleftarrow{y}_{4b}\right)\Theta\left(\overleftarrow{v} - \overleftarrow{v}_1\right).
\end{aligned}$$

5. Conclusions

When compiling the reflex formation and memorization model, one of the essential conditions for the existence of the company is observed: effective human resource management is the guarantor of the sustainability of a company. The developed model can carry out the selection and classification of information that enters the company from the global environment and is an important factor that can help the company respond to possible external signals promptly. It also provides for the possibility of the model accumulating unused (at that moment) information that may be useful at a later time. The realism of the model is based on mathematical functions that ensure its functionality. This model can help a sustainable organization regulate human resources in such a way that effective control of incoming information is achieved, which will allow to effectively maintain the sustainability of the company.

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