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Research Results / Резултати от научни изследвания

INCREASING CSR THROUGH A METHODOLOGY FOR INTELLIGENT PERSONAL EFFICIENCY OF EMPLOYEES

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Abstract. Corporate social responsibility affects the interests of a wide range of stakeholders, but among the most important for it are the employees themselves in the organizations. This material is aimed at increasing the efficiency of employees by reducing their personal stress levels in the work environment. For this purpose, a methodology for personal effectiveness of employees (PEE) is proposed here. PEE is a conceptual view on the collaboration of different intelligent tools to monitor the stress levels in employees and offer different individual mechanisms to deal with it, according to the specific tasks, capabilities, and psycho-physical state. The proposed methodology is considered an alternative to an accurate and impartial mechanism through which CSR can be increased, it is applicable in a wide range of businesses and has a beneficial effect on employees.

Keywords: Corporate social responsibility; AI; Employee; Stress

JEL Classification: M21, O32, O35

1. Introduction

In order to ensure a high degree of competitiveness and adaptability of business, it is necessary for companies to implement a social business strategy integrated into their strategic goals. It must create value and positive social change and be embedded in all business processes and the overall business culture of the organization (McElhaney 2009). Achieving this is linked to maintaining and enhancing corporate social responsibility (CSR). CSR is a link between business and society and expresses the extent to which companies have responsibilities beyond the pursuit of their economic self-interest. The relationship between CSR and firm performance has been recognized in numerous research studies (Abu Bakar & Ameer, 2011; García et al. 2021). At the same time, issues with a focus on employees are also raised. The ethical aspects of human resource management have a key influence on the way CSR is understood, developed, and implemented (García et al. 2021). The established interrelationship between CSR and human resources creates the need

for continued research (DeNisi, Wilson & Biteman 2014) and knowledge development in this area. Motivated by the need for continuous enhancement of CSR functionalities, in this article we propose a methodology for personal employee effectiveness (PEE). It is based on the thesis that the application of CSR largely depends on internal company factors, among which the leading asset is human resources. The goal can be divided into two main directions. First, the PEE methodology is a means of increasing the functionality of CSR and contributes to the development of company goals. The second is aimed at the application of AI in a social aspect. With this goal, we show that AI is not the "enemy" of employees but can help them perform their work duties in a more balanced way, considering their levels of tension and stress. Thus, several employee health problems can be minimized. With the methodology proposed here, we believe that the employees will perform their duties in a favourable environment tailored to their specific circumstances and characteristics. This will allow their capacity to be used more fully and with better motivation. At the same time, during times of temporary indisposition, employees will be assigned lighter responsibilities. It is important to emphasize that the methodology is developed at a conceptual level and is based on the application of various tools based on artificial intelligence. The limitation is set here that the specific algorithms of the functioning of the various tools in it are not given, but the functionality on which it works is outlined.

This research paper is structured as follows. A literature review conducted on the basis of three main directions, in which research views on the state of science in the field of CSR are presented. They relate to contemporary conceptions of CSR, the place of personnel in CSR and the place of artificial intelligence in CSR. The following is a description of the developed methodology, steps, and implementation. The paper concludes with a discussion and conclusions section.

2. Literature Review

2.1. Background of Corporate social responsibility

The positions of corporate social responsibility in the activities of business organizations have already been established. CSR occupies a central place in the sustainable development and general competitiveness of companies. Responsibilities are focused on areas such as: regulatory framework, ethics, strategies, interactions with third parties, management of conflicts of interest, both short-term and long-term, both private and global (Zhao 2018). The benefits of its application are aimed at protecting the environment, have a social and economic focus (Mason & Simmons 2014). Going deeper, economic benefits can be classified as financial and non-financial. On the other hand, financial ones include direct monetary benefits related to increased revenues and reduced costs (Yadlapalli et al. 2020). While the non-financial ones are expressed in increasing the reputation, retention and attraction of new customers. When carrying out CSR-related activities, busi-

ness organizations necessarily interact with various groups of stakeholders (Mani and Gunasekaran 2018). Here, all stakeholders that affect and are affected by the given business must be taken into account. They can be conditionally divided into two groups Primary and Secondary, described in Fig.1.

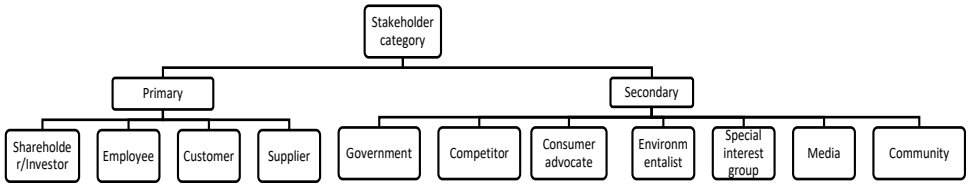

Figure 1. Categories of stakeholders in CSR relations

As can be seen, the stakeholder group is wide-ranging. Therefore, we limit this research to focus only on primary and specifically on staff.

2.2. The place of personnel in CSR

Internal company factors are essential for building the right CSR policy and strategy. Its main element is human resources, i.e. CSR is applied in internal organizational relations, emphasizing the improvement of relationships between people (Zhao 2018) and their motivation and loyalty. Good company policy focuses on training human resources, developing their sense of social responsibility, their relationships, and their sense of justice and morality. According to McElhaney (2009), the benefits to human resources are undeniable. Ivanov and Molhova (2023) show good practices for training and technological development. Employees are more satisfied and more loyal to companies with a proven commitment to corporate responsibility. In this way, CSR is an effective strategy for recruiting and retaining top talent, which has obvious positive consequences for reaching the company's strategic goals. Bauman and Skitka (2012) defined four main effects on employees: (1) a sense of security and safety that their material needs will be met, (2) self-esteem that stems from a positive social identity, (3) a sense of belonging and social affirmation of important values and (4) existential meaning and a deeper sense of purpose in work. It is evident that employees have their contribution in CSR (Lindgreen, Maon & Vallaster 2016). Their actions are indicative of the degree of "objectivity and truth" in the firm's demonstrated strategies (Scheidler et al. 2018). Therefore, companies must realize their importance in building their CSR image by applying an inside-out (Carlini et al. 2019) approach, educating ethical norms in solving corporate and interpersonal cases and realizing that the moral obligations of all employees are interconnected (Zhao 2018).

The contributions of this paper are also directed in this direction. In part 3, we analyse the relationship between the personal effectiveness and its disruptions

under the influence of factors as stress and fatigue and in answer, a mechanism to overcome them, through an intelligent system based on AI tools. This allows to multiply the benefits related to the company's efficiency in two directions: increasing CSR and increasing employee satisfaction and productivity.

2.3. The place of artificial intelligence in CSR

The entry of artificial intelligence into CSR, like all other corporate activities, is on the agenda and the subject of analysis by numerous researchers. AI is considered both in terms of the opportunities it provides and the threat it poses to human individuals. Zhao (2018) explores the possibilities of improving the social responsibility of artificial intelligence and the achievement of sustainable development of artificial intelligence, through the adoption of international social responsibility (ISO 26000 standard). Lachuer and Jabeur (2022) examine the relationship between corporate social responsibility and corporate financial performance in a rising market. For their purposes, they use an innovative approach based on artificial intelligence (XAI). Zavyalova and team (2023) develop a humanistic model of corporate social responsibility in e-commerce, relying on high technologies in the artificial intelligence economy. In this group of studies, artificial intelligence is used more as an aid to reach better conclusions related to the results of CSR application. There are not a few studies related to the ethics of machines, the neglect of human intelligence. Krkač and Bračević (2020) present the issues of artificial intelligence and social responsibility from the perspective of robot ethics and machine ethics. In the same connection, Zhao (2018) identified that the moral dilemma of human beings is not the main problem that CSR emphasizes, but the responsibility that people have to bear under the threat of technological dominance, the survival and development of human beings, and the degree of our care for the earth and its future.

From the review of the literature, it can be seen that there are still a number of unsolved problems. Not enough research is found to show the positive effects of using AI in CSR. What's more, how to use smart solutions to increase employee efficiency and reduce staff stress. This gives reason to propose here a methodology that can be applied in a wide range of business organizations, affecting CSR and the personal performance of employees.

3. Personal Effectiveness of Employees (PEE) methodology and road map for its implementation

3.1. Purpose of PEE

PEE is a product of the author's views on increasing the efficiency of human resources, through the use of intelligent tools based on artificial intelligence, aimed at reducing the level of stress in employees. PEE was developed in fulfilment of the CSR responsibilities of business organizations and is aimed at improving the working environment of their employees. The methodology is presented at a conceptual level, without affecting the specific mechanism of functionality of AI and a group

of intelligent tools, as well as the algorithms with which they work. The purpose of PEE is to show the mechanism of stress reduction in employees. It is important to note that in this form, PEE is intended for business organizations where complex analytical and/or development activities are carried out, requiring employees to solve complex cases. The basis for this choice is the traditionally high level of stress and frequent panic attacks to which employees are subjected. It is known that high levels of work-related stress often occur in response to job demands that exceed the ability of employees when they cannot be balanced by skills and knowledge (Asplund 2022).

The main tools with which the methodology works are reduced to AI, ML, Computer Vision, ontological analysis, etc. The non-PEE functionality is aimed at conducting an intelligent analysis and drawing conclusions in the form of specific recommendations to the employee, when an increased level of stress is detected. PEE is committed to creating a balanced work environment, with reduced levels of stress, and hence more motivated and efficient employees. With the implementation of PEE, business organizations can increase the satisfaction of their employees, optimize the execution time of the main processes, increase CSR, and from there, the overall competitiveness of the organization.

3.2. Roadmap for the implementation of PEE

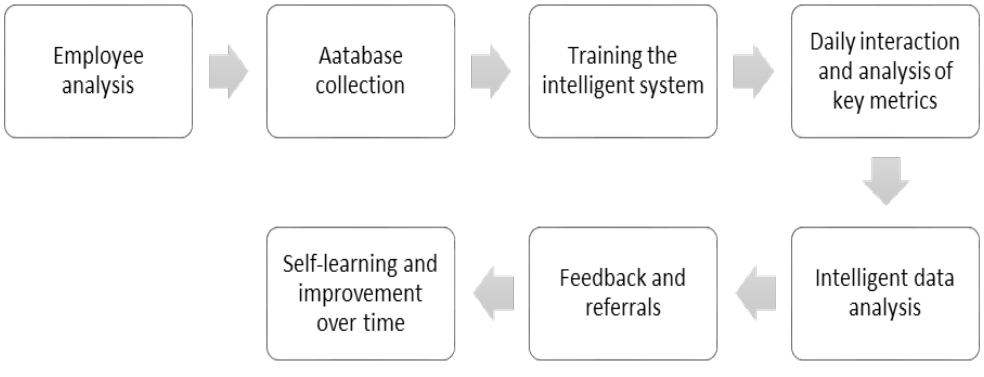

Figure 2. Road map for implementing PEE

For the successful functioning of the PEE model, it is necessary to start with an analysis of each individual employee. This is required by the circumstances that human individuals, although they have similarities in the reactions are specific, their threshold of tolerance to load is different; stress levels when performing individual work activities is also different. For this reason, the methodology for implementing PEE begins with **a personal analysis of the specific employee**. It should be done already when applying to the company (to determine whether it is suitable for a specific position or not) and then in more detail when starting work. It should be noted here that the model

also provides for subsequent periodic analysis that reflects changes in the employee's behaviour. In this first step, two main areas for which data are needed are affected - one providing general personnel information and the other specific. With regard to the first, data about the employee is entered regarding gender, age, professional training, professional experience, marital status, etc. Based on these, intelligent inferences can be made about common behaviour based on analysis of the already existing database and historically manifested reactions from employees. The second refers to the specifics of the specific employee. Here it is necessary to take into account individual interests, level of motivation and motivating factors, stress factors, personal factors that would have an impact on the employee's work, stress tolerance threshold, reactions, etc. These factors provide information about potential reactions in specific situations. Here, it is important to define different mechanisms that would have a positive impact on the manifestation of a stressful situation. For example, some people would reduce their stress levels if they listened to relaxing music, others if they stopped working for a short period of time so that they could regain their normal working state, others would complete the stressful task more quickly, etc. I.e. the purpose of this initial analysis is to establish what is the usual state and what are the reactions of the particular employee in a normal state; what situations can bring him out of it; what reactions would he show; and what mechanisms to apply to him so as to reduce his stress level and increase his productivity.

Secondly, the PEE methodology requires the creation of a **database**. It provides access to the data of both the specific employee and for planning responses to similar groups of employees. Historical data for multiple employees grouped into certain parameters provides a comprehensive visualization of the specific employee's pattern in relation to the work environment and social factors. I.e. against the historical data of similar employees (by group of interests and social prerequisites) we can determine the expected parameters for a given employee in a specific work environment.

The stability of the database is guaranteed against the historical and current data of all employees based on the real work environment and social factors in the specifics of the study. This means that a preliminary analysis of each employee through ML is possible based on historical and current data compared with ontological, social and applied psychological analysis and intelligent one.

The third step of the methodology is **training the intelligent system.** This is where the mechanisms of ML and AI come into play. An intelligent system is a complex set of technological and social factors. Based on the above information, the system can be defined as an interaction of ML and AI from the point of view of corporate and individual identity. It implies collaboration between the historical data of multiple employees and groups of such, compared to the specific individual possessing maximally similar input parameters for personal performance / development.

Historical data provides information compatibility with the employee's personal parameters. In turn, AI provides maximum comparative truth of parameters based on mathematical and algorithmic analyses. Based on the previous analysis, ML and AI provide the most truthful information about the specific employee, through which a personal and corporate profile is prepared for the behaviour and interaction at all levels with the individual. Depending on the displayed data, it can assess what work processes motivate the employee and what stressors can disrupt his work efficiency.

The interrelationship between the technological methodologies of ML and AI versus human and corporate judgment provide a complete interactive approach to the specific employee, reconciling the entire historical information verified by the expert.

Daily interaction and analysis of basic indicators - at this step of the methodology, the basic (daily) interaction between the employee and the intelligent system is performed. It should be noted here that the PEE does not engage the attention of the employee so that he feels watched or feels anxiety while performing his work duties. The interaction takes place through the computer's camera and the computer vision capabilities of the intelligent software. Computer vision observes reactions and interaction with cyber-physical spaces (interaction with keyboard, mouse, visited sites, programs, software for tracking work tasks, time to complete tasks, etc.). Other input information flows can also be used as data input (external input systems: video surveillance system, access control, time control, HR systems, etc.).

The next step **is intelligent data analysis**. Its purpose is to determine individual factors related to emotional state, concentration, physical condition, motivation, activity, etc. of the specific employee. With the help of the specified tools and ML analysis, the levels of the stress factor are determined. Their parameters and intellectual abilities to deal with the tasks for a certain period of time are valued. In addition, the complexity, stressor, interaction and interaction of the task in the general work environment are considered. In this way, information is obtained about the compatibility between the employee's capabilities, the complexity of the task and the success in execution. This is where **feedback and referrals should take place**. The intelligent system performs a risk assessment in order to determine the possibilities of achieving a positive result. For example, if, other things being equal, an employee with lesser capabilities needs to prove himself in the hierarchy and has the motivation to perform a task of higher complexity, then intelligent risk assessment gives him a positive "light" to tackle the task. If the conclusion of the intelligent risk management shows that the task is too stressful, the system provides an opportunity for a mentoring service. It may be based on a recommendation to include a second employee with a higher stress threshold and success factor to assist the primary employee. Another alternative is PEE's recommendation to provide specialized training in the form of a video or instructional document; next a

potential recommendation could be to stop the current job and give a short break or a recommendation to use another approach. Here, the goal is for the intelligent system to recommend the most appropriate approach that takes into account both the specifications of the task at hand and those of the employee.

The last step of the PEE application methodology is related to s**elf-learning and improvement over time**. In order to achieve high efficiency and sustainability over time, PEE needs to work with a large set of quality data that accumulates over time in a real working environment. This means that when PEE gives a recommendation to an employee, he has a choice - to accept it or not. In the event that the recommendation is rejected, intelligent analysis is triggered to establish the reasons for rejection. If it is related to the employee's assessment of the inappropriateness of the proposed decision, an analysis is conducted and a new one is proposed. In this way, the system is self-learning and evolves over time.

4. Discussion

With the introduction of AI in the analysis of the emotional state of employees, several controversial questions arise. They are often associated with resistance to intruding into employees' personal space. Another thing to consider is how willing employees will be to provide information about themselves? Next, can people do it on their own or will the system be better? Although many employees believe that their judgment is better than that of machines and emotional intelligence cannot yet be achieved, it is a fact that many cases of stress caused by the work environment lead to disorders of health conditions, including various forms of psychological and physical risks. The World Health Organization reports that work-related stress can be caused by poor work organization, lack of control over work, lack of support from managers and colleagues, and poor management[1]. According to Asplund and his team (2022), high job demands can exhaust employees and lead to energy and health problems. All of this gives reason to conclude that, focused on the performance of work tasks, people neglect their emotional and health condition, and this leads to various forms of psychological and physical disorders. Naturally, when they occur, the interests of the employer are affected. For this reason, it is important for corporate welfare organizations to take care of their employees. The study found that the topic related to CSR and stress in companies is on the agenda, research on the topic should be deepened and appropriate solutions to reduce stress should be sought. As a potential solution, the PEE methodology is a good alternative for reducing the level of stress, which, on the one hand, will reduce risk events related to stress and the health of employees, and on the other hand, will increase their efficiency, providing them with an appropriate workload, taking into account their individual capabilities and conditions, in which they are located. Thanks to AI's tools, PEE provides individual analysis of responsibilities, connections, corporate

relations, integration with the corporate information system and interaction of employees with company norms and responsibilities of the employee's profile. Providing a quality database with information such as employees' moods, employees' working or outside behaviour etc., allows the complex ML algorithms to be triggered and high-quality conclusions to be obtained, giving direction and an individual approach to action in each specific case. Thus, the application of PEE will allow the company to increase both the quality of the work processes and the general competitiveness.

Conclusion

The entry of artificial intelligence into the business processes of organizations is inevitable. With PEE, we show that it does not threaten employees' jobs, but can contribute to their development in a balanced environment. This paper outlines development trends that should increase the overall competitiveness of business organizations. This work is honoured by a larger study that aims to trace the place of AI in general management, both what is already being implemented and to highlight opportunities that are yet to be discovered. It is clear that the next 10 years will see a transformation that will require business to be highly flexible and adaptable to technology so that it is a benefit and not a hindrance to it.

The findings of this study provide important information on the development of CSR in the part of it related to the internal stakeholders and in particular the employees of the business organization. The results indicate that the PEE methodology can be adapted and give positive results for the reduction of stress and its related consequences in various businesses requiring high levels of concentration from employees. The use of intelligent tools in the methodology guarantees impartiality and a correct assessment of the condition of each employee. Individual solutions for specific measures to reduce stress for each employee take into account their specific needs. This guarantees the increase in the productivity and efficiency of the employees, and hence of the company. The PEE methodology could be easily implemented in a business environment, and the application of intelligent tools is a step towards the general integration of all business processes, aimed at legal entry into Industry 4.0, and from there into the era of AI management.

The aspiration to improve CSR policies and linking them to the individual performance of employees is a reason for continuing the work on the development of the PEE methodology. The authors' further research will focus on the mechanisms for its implementation in a business environment.

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NOTE

1. World Health Organization. Occupational health: Stress at the workplace. 2020. Available at: https://www.who.int/news-room/q-a-detail/ccupational-health-stress-at-the-workplace.

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