
Designing the Conditions for the Proactive Attitude of Employees to Increase Organizational Resilience

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Abstract:

Purpose: The aim of the article is to present the achievements in the field of improving occupational safety based on a formalized record of an in-depth analysis of occupational risk with the use of biometric data, which are created with the participation of professional employees.

Approach: Using the structure of system analysis, the authors of the articles presented the mechanism of employee participation in creating conditions for the development of a proactive attitude in individual workplaces to improve the safety of the entire organization. For this purpose, biomedical indicators, and personal involvement of employees in health protection through innovative solutions and proprietary rationalization projects were used.

Findings: A procedure for obtaining, processing, and sharing information on the situational context of potential events, thanks to which the experience of one employee becomes generalized knowledge in the field of a holistic approach to organizational resilience.

Practical Implications: The effect of the published research is to provide small and medium-sized companies with a standard approach to improving occupational health and safety.

Originality Value: The authors of the article developed guidelines for modifying the methods of occupational risk analysis to design a procedure of increasing organizational resilience adequate for a given company on the basis of employees' experience, knowledge and rational inference.

Keywords: OHS, organizational resilience, proactive attitude, in-depth analysis of occupational risk, evidence base.

JEL Classification: M2, E24.

Paper Type: Research article.

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1. Introduction

In search of an answer to the question "How to improve the occupational safety management system in order to respond to sudden changes and manage an organization that will be resistant to potentially accidental situations, failures or crises?" we face difficult issues related to the increase in threats (Cox, 1993), which are of a very complex nature. They mainly include psychosocial and ergonomic risks (EU-OSHA Report, 2019). They are accompanied by such phenomena as technological progress, development of digital technologies and innovation, new business strategies, full-time remote work, lack of social interaction (Cox *et al.*, 2005; Sahebjamnia *et al.*, 2018).

The answer to this question may be the implementation of the management concept, which is focused on anticipating and managing changes and human resources (Łobos and Puciato, 2013; Urbaniak, 2014). To meet this, it is necessary to develop awareness, increase the knowledge and commitment of each employee, and as a result stimulate a proactive attitude (Seville, 2018; Kubasiński *et al.*, 2019). The word "proactivity" is most often used interchangeably with "taking initiative". On the other hand, a proactive attitude to solving problems is included in anticipating the difficulties to come and preparing solutions to difficult situations in advance. Proactivity is also largely associated with responsibility for overall functioning through specific, well-thought-out actions (Peñaflor and Juevesa, 2021).

Table 1. Summary of research results with the use of questionnaire sheets in the assessment of personal involvement in creating positive changes in work, source: own research

Nr	Absolutel y YES	Rather YES	I do not know	Rather NO	Absolutely NO
1	2	3	4	5	6
1-Is your life experience driving you to look for the problems you are looking for a way to solve them?	35	53	27	5	5
2-Do you feel the need to make changes that can improve the functioning of the environment?	26	57	23	18	1
3-Is your professional success and safety at work dependent primarily on you?	33	59	13	17	3
4-Are you looking for ways to make your work easier?	48	72	2	3	0
5-Do you see mistakes as something that develops and strengthens you?	44	62	9	9	1

Source: Own study.

Conducting observations in manufacturing companies, the authors of this article conducted a study on a group of 125 people to verify the opinion on the personal commitment of employees to the issue of improving safety in the workplace. The obtained results prove that most employees are actively involved in improving their functioning (Table 1). It can be noticed that in columns 2 and 3 (definitely YES and rather Yes) there are the greatest number of responses in total. The results indicate the presence of features in the group of respondents, which include the characteristics of a proactive human attitude: 1 – commitment, 2 – activity, 3 – responsibility, 4 – creativity, 5 – rationality. The research was carried out in enterprises where integrated requirements of occupational safety management are implemented on the basis of the guidelines of ISO 45001.

As Peñaflor and Juevesa (2021) note in their works, a proactive person in working life is one who takes specific actions, which can include, seeking feedback, suggesting improvements or signaling irregularities – reporting offenses in the organization (Peñaflor and Juevesa, 2021). The idea of developing a proactive attitude among employees of modern organizations fits very well with the concept of building organizational resilience. It focuses on reacting, i.e., on current removal of irregularities identified during monitoring. As a result of the above processes, there is a quick reaction to avoid potential disturbances, preceded by predicting undesirable events, i.e., anticipating.

If the knowledge resulting from the accident analysis is extended to include information on the success factors of OHS management, then the occupational safety management system becomes significantly more flexible and the organizational resilience increases.

2. The Importance of Feedback for Increasing Organizational Resilience

The requirement of continuous improvement of occupational safety entails the development of resources that strengthen organizational resilience. Since security, by definition, is the implementation of specific possibilities that have been created for the system, informing about the state of resources in this area becomes crucial. The very flow of information between individual units in different positions (employees and top management), in relation to a specific problem, should be clear and understandable (Ewertowski and Kubasiński, 2021).

By implementing technologies that will allow for updating information in real time and making it available flexibly to the needs, we meet the next postulate of creating organizational resilience, i.e., the dynamic ability of an organization to adapt, which grows and develops over time. In his works, he writes about the factors increasing the resilience of an organization, which are unique to each organization.

Tomasz Ewertowski (2020) pointing to the differences between static and dynamic resistance, important for the maintenance of work safety. Static resistance is obtained thanks to investments in the so-called the readiness of technical systems, that is: a specific set of objective elements (people and technology), a set of non-objective elements (activities), and a ready structure and the structure of an action. The readiness structure of the system indicates how many and which subject elements of the system should be able to start preparing for the performance of designated functions, to recognize that the

system as a whole is capable of starting preparation for the performance of designated tasks. The structure of the activity defines which preparatory activities need to be carried out and at what time in order to consider that the system as a whole has been prepared in a timely manner to start the implementation of the envisaged tasks. Maintaining the readiness of the technical system is investing in the resources of the organization, which give the ability to start the planned tasks in a timely manner.

When addressing the problem of designing conditions for the increase of organizational resilience, it should be emphasized that although for each of the heterogeneous elements of the organization improvement is achieved differently, it is always in a way of gradual "learning" from everyday events. By paying particular attention to the factors of the employee's functioning, we improve the critical element, which is least determined (Lengnick-Hall *et al.*, 2011). Since resilience is the ability of the entire organization, a systemic understanding of how an incident or event affects the organization is the basis for anticipating, preparing, reacting, and adapting to everything from minor everyday events to critical incidents.

3. Employee Participation and Consultation in Creating Organizational Resilience

3.1 In-Depth Analysis of Occupational Risk in Creating the Evidence Base

If we assume that safety is the implementation of specific opportunities that have been created for the system, then the occupational risk analysis is a way to assess the level of work safety and create the basis for crisis management (Koronis and Ponis, 2018). In order to analyze the threats to the system and to document significant phenomena, it is necessary to: 1) obtain information to understand the essence of the system; 2) define the scope and purpose of the analysis; 3) select and apply an analysis method; and 4) evaluate the results of the analysis to make decisions on the adequacy of the obtained data in relation to the purpose of the study. A security analyst has a wide range of tools and methods at his disposal in this area (Górny, 2011).

The accident investigation methods used make it possible to determine the causes and circumstances of the accident, enabling the design of preventive measures. Not every method is able to detect all sources of threat risk. Some of the methods, such as the fault tree, the event tree and the cause tree, which are based on logical diagrams, allow to track the sequence of accident events, and only a deeper analysis of individual elements of the previously developed diagrams allows to determine the most likely causes. For most organizations, occupational safety management can be reduced to the following 5 steps:

1. determining threats and indicating people at risk,
2. assessing the types of risk and arranging them according to their importance,
3. decision on preventive actions,
4. implementation of activities,
5. monitoring and assessment of the situation.

In order to perform an in-depth analysis of complex accidents, the WAIT (Work Accidents Investigation Technique) method and Human Error Analysis (HRA), also known as the human reliability analysis, which is a set of methods aimed at identifying and analyzing the causes of events caused by the human factor, deserve attention. The first, the WAIT method, is an example of a systematic and logical approach to investigating accidents at work. Its feature is the search for the so-called positive effects on work safety.

The method consists of two steps. In the first stage of the procedure, a simplified accident investigation is carried out. The basic causes and circumstances of the accident are investigated, and information is also obtained for the registration and documentation of the event. In the second stage of the procedure, an in-depth analysis is carried out. In the in-depth accident analysis, weaknesses and shortcomings are identified and analyzed, as well as determinable determinants of the work organization. When examining an accident using the WAIT method, there are clear differences between observable events - facts, and interpretations and conclusions.

This methodology adopts the principle of multiple causes and the principle of system dysfunction leading to an accident. Hidden events, bugs, or conditions are usually difficult to detect. They are related to deficiencies or weaknesses in the organization of work. Basic analysis includes collecting information, identifying active events and errors, determining possible influence factors, comparing the results of the analysis with the results of the occupational risk assessment. The next five steps of the analysis are performed to identify the causes in management, thanks to the identification of the so-called work-related and individual factors.

An in-depth analysis is a study of relations that indicate links with the occupational health and safety management system. Next comes the development of preventive measures, in particular the search for positive factors. The final step involves a re-review of all available information. If necessary, employees are interviewed again and information that may have been ignored so far is recorded. The information obtained during the in-depth analysis is widely consulted. The current evidence base may only be established with the active participation of employees.

Table 2. Decision table for the functioning of the prep-pumping station, source: own research

Potentially accidental events	Valve failure	YES	YES	–	YES
	Valve opened by control system	–	YES	–	YES
	Level sensor failure	–	YES	YES	YES
	Pump activated by the control system	–	–	NO	NO
	A parallel task to distract the operator	YES	-	YES	-

	Engage in a conversation with your supervisor	YES	YES	YES	YES
	Error in the interpretation of the signal on the control panel	YES	-	-	-
Adverse events	Overflow with pump running	X	-	-	-
	Overflow with the pump switched off	-	X	X	X
	The valve is open when the pump is switched on	X	-	-	-
	The valve is open when the pump is turned off	-	X	-	X
	Pump off	-	-	X	-
	Tank overflow	X	X	X	X

Source: Own study.

Using the second method – HRA, the impact of people on the functioning of individual processes, systems, but also machines is analyzed, and the impact of human errors on their reliability is assessed. HRA is usually performed after another type of analysis, such as HAZOP (HAZards and OPerability Study) or FMEA (Failure Mode and Effect Analysis), which shows the influence of human error on the occurrence of dangerous effects. The output data in the HRA method are a list of errors that may occur and methods of their elimination, as well as a qualitative and quantitative assessment of the risk posed by employee errors.

The records that are created during the occupational risk analysis complete the information important for increasing organizational resilience. If the discussed information resources are supplemented with data on the behavior of employees in stressful situations, then thanks to specific tools used in decision-making processes, such as, for example, a decision table (Table 2) we will enrich the resistance system with elements of dynamic resistance. Participation in such projects must be based on high personal commitment of employees who are characterized by a proactive attitude.

As can be seen in the shaded lines of Table 2, the information contained in the conditions field comes from employees and relates to their functioning in the workplace and indicates the functioning of the technical system.

3.2 Capitalization of Experience in Integrated Occupational Safety Management

The capitalization of experiences, like the capitalization of knowledge, is mainly done by creating databases, thanks to which the registered knowledge about phenomena interesting in each aspect is created (Brilman, 2002; Sławińska *et al.*, 2019). Therefore, to interpret the phenomena and on this basis build the ability to counteract the effects of damage that pose a threat to health and life, it is necessary to involve employees at all levels of the organization.

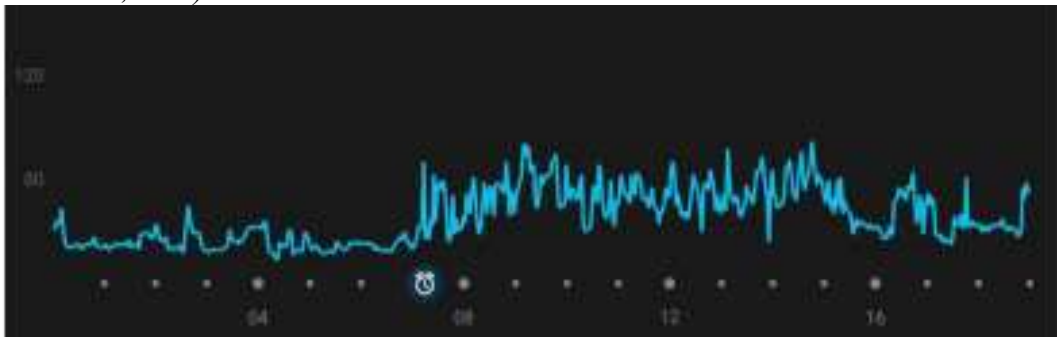
Moreover, it must be emphasized that it is the daily activity that is the source of the response, which is based on information obtained from organizational learning. On the other hand, process monitoring ensures the flexibility of the OHS management system, which in total determines the correct implementation of the response and implementation of solutions enabling real-time response. The capitalization of experience in the resources of the obtained information is carried out, among others, by to create hazardous behavior modification programs, and intelligent health and safety monitoring and management systems enable real-time response to changes in the working environment (Walkowiak and Sławińska, 2020).

The use of advanced technologies, devices and electronic, textronic (Sibiński and Ciupa, 2010), mechatronic, IT and telecommunications systems for occupational health and safety open new areas for increasing organizational resilience, where the basic element is feedback, i.e., a reaction to dangerous employee behavior. This enables personalization of the risk assessment for the individual employee profile, considering his psychophysical condition, real factors of the working environment and location in relation to the machine park.

An example of a practical approach to the capitalization of experiences for the improvement of occupational safety is the project of organizing the work of a teacher of preschool children with the use of wireless technology, which was implemented in one of the kindergartens in the city of Poznań (Walkowiak and Sławińska, 2020). Modifications of the conditions of human functioning were carried out in real time, with the personal participation of the diagnosed person. In order to take into account, the situational context and to be able to take into account the exposure time, the residual pulse method was used.

The 24-hour recording of the heart rate of a person covered by the improvement of the ergonomics of functioning conditions at the time of introducing changes was treated as a real improvement index (Figure 1), because the heart rate is a good indicator of workload, while being the easiest to measure and record an indicator of the cardiovascular response to exercise (Groborz and Juliszewski, 2005).

Figure 1. 24/7 heart rate measurement, source: own research (Walkowiak and Sławińska, 2020)



Source: Own study.

Maximum heart rate, corresponding to the maximum heart rate (HR_{max}), is essentially independent of physical fitness and training. We calculate its value by subtracting the age of the respondent in years from 220. The minimum heart rate, corresponding to the minimum heart rate (HR_{min} - also known as the base heart rate), occurs during the minimum activity of the body - sleep - and is individually individualized. It is usually between 45-70 / min. The difference between the maximum and minimum heart rate, the so-called heart rate reserve is the "reserve" by which the heart can increase its rate during exercise. Heart rate reserve is described by the percentage of heart rate reserve utilization.

Based on the data interpreted in this way, control mechanisms were introduced, automatics of the parameters of the material work environment, and with the personal involvement of the employee, changes were introduced to increase the organizational resilience of the educational institution.

In the proposed approach, in which the mechanisms of avoiding problems and difficulties are designed, the factors related to the construction of the organization itself (e.g., adopted goals, structural solutions, technology used, etc.), but also the so-called soft elements, i.e., social norms, behavior patterns (proactive attitude), communication methods influencing adaptation skills, the basis is the capitalization of experiences. The accumulated experience, which becomes the knowledge shared in the organization through the records, allows to understand the mechanisms shaping the resilience of the organization. At the same time, the response to risks and incidents that may disrupt the activities of the organization is improved.

4. Proactive Attitude as an Element of Culture to prevent Safety Threats

Referring to good practices and standards is the practice of improving the quality of management and improving occupational health and safety. An example of a normative document that introduces the requirements of integrated occupational safety management is ISO 45 001. The systemic approach to integrated health and safety management implemented in accordance with the standard brings benefits in developing a culture of preventing occupational safety hazards.

It also emphasizes and explains in detail what the process of employee participation and consultation should look like, and by adding it to the leadership division it underlines the responsibility of top management in this process. According to Pawłowska and Skład (2017), the basic condition for the effective functioning of the company, considering the provisions of the ISO 45001:2018 standard, is the participation of employees, understood as their involvement in decision-making by the top management (Pawłowska and Skład, 2017). Sonnentag states that committed employees in the organization are vigorous, absorbent, but also characterized by their loyalty, satisfaction, and encouragement (Sonnentag, 2003).

Employee motivation is an equally important element in shaping a proactive attitude in the organization. As emphasized by Sadłowska-Wrzesińska and Nejman (2016)

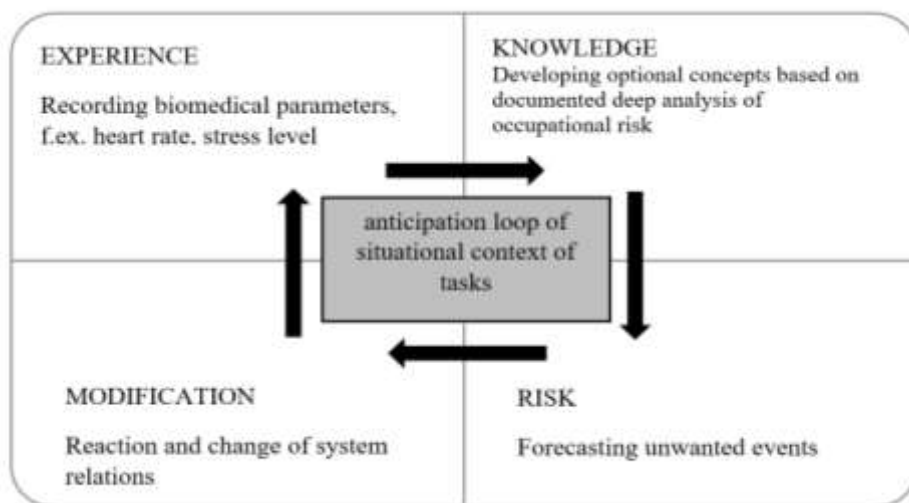
motivation significantly affects the attitudes and behavior of employees using specific stimuli.

The sentence, "The system is as strong as its weakest element" can be used to evaluate the system through the prism of the analysis of the employee's purposeful tasks. If the point of reference in assessing the organization's resistance to undesirable situations is the functioning of the employee, then the development of a proactive attitude may be taken as a necessary element of the culture of preventing occupational safety hazards. To carry out such a method, building organizational resilience is very important to the practical possibility of registering, assessing, and changing behavior in the workplace.

In order for a proactive attitude to become a permanent part of the safety risk prevention system, it is required to create mechanisms for stimulating specific behaviors in the occupational health and safety management system based on the anticipation loop of the situational context of goal-oriented tasks (Figure 2). This requires designing the conditions for a proactive attitude of employees, thanks to which the responsibility for the overall functioning of the organization will increase and will trigger creative and thoughtful action.

This is achieved by using an information system that provides feedback and creates an environment for the feedback in the anticipation loop. Modern information technologies are the right tool for this purpose. They create an environment for the integration of information contained in knowledge resources with feedback that affects the updating of the experience. The information is still being supplemented by an in-depth analysis of important phenomena. Next comes the reaction and changes in system relations and introducing modifications to increase organizational resilience.

Figure 2. General scheme of the structure of the elements of the anticipation loop of the situational context of goal-oriented tasks in the process of capitalization of experiences



Source: Own research.

It should be emphasized that gaining knowledge and drawing conclusions is based on past events, both successes and failures, while the analysis of positive events is as important as studying the causes of failures, e.g. accidents at work and near misses.

5. Summary

In order to verify the adopted research assumptions, it was decided to conduct an experiment. Research problem, “Can feedback on body functioning stimulate proactive behavior?” For this purpose, eight interested persons were given devices recording biometric data, thanks to which it was possible to track, inter alia, the course of the stress level. At the first stage of the experiment, the purpose of the research and the plan for its implementation were discussed, the possibilities of registering biometric information of the smart watch user, the device recording data on the employee's well-being and the method of recording information were presented.

At stage II – preliminary attempts were made to record information about the state of the organism. For this purpose, consultations and mock tests were carried out over a period appropriate to the individual. In this way, the employee moved from the stage of gaining experience to the stage of acquired knowledge (Figure 2). In stage III – traditional methods of creating a record of the work process are discussed. The proposed use of the working day photo sheet, which is the basic tool at the stage of preliminary research and is used to record phenomena occurring in the workplace (Sławińska, 2011).

At stage IV – the course of the targeted tasks was documented, and in the attention field, in the aforementioned sheet, information about the observed inconsistencies resulting from the task schedule and ergonomic requirements was provided. At stage V – the employee independently assessed the biometric data and decided whether to make them available. At stage VI – the employee conducted a comparative analysis of both records: 1) the course of the work process and 2) the course of the recorded indicators of the state of the functioning of his own body during work.

At stage VII – the researcher and the employee described the situational context of the goal-oriented tasks, which preceded the clear change during biometric data recorded on the timeline. At the same time, an in-depth analysis of occupational risk was performed with the use of the WAIT method sheet. In this way, the employee moved from the knowledge phase to the risk phase in the loop of anticipating the situational context of goal-oriented tasks. At stage VIII – the employee independently took up the problem of identifying opportunities which, in his opinion, may have a positive impact on the conditions of work safety. All solutions modifying working conditions have been registered.

At stage IX – the time and cost possibilities of the proposed changes were estimated. It was observed that simultaneously with the creation of changes and consultations, in the opinion of employees, there was a clear development of their personal experience. At stage X, in which the experiment was summarized, it was found that all eight people who volunteered to participate in the above experiment undertook the further task of self-

recording of information related to the monitoring of the work process and did not give up on continuing the improvement of conditions in the workplace in their company.

Based on the experiment, the authors of the article confirmed the accuracy of the assumption: "In order to improve the safety at work of each employee, conditions must be created to stimulate a proactive attitude." For this purpose, it is necessary to record current data related to the course of target tasks, preferably in real time. They are interesting for every person. Biometric data recording devices are required in this respect. The authors of the article emphasize the need to ensure independent, personal analysis of such data by the employee, and the use of this data only with his consent.

The research presented in the article and in the direction outlined by the authors will contribute to the comprehensive awareness of the risks associated with accidents at work, injuries, and occupational diseases among employees of each organization. At the same time, they indicate possible ways of minimizing, reducing, and controlling occupational risk and related social and economic costs.

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