
Success Factors of Ergonomic Committee's Performance within Production Companies

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Abstract:

Purpose: The aim of the article is to investigate the factors influencing the successful implementation of ergonomic measures in manufacturing companies in the context of the effects of ergonomic committees' activities.

Design/Methodology/Approach: Tug-of-War scenarios and a deep questionnaire method were used to conduct the research. Qualify approach was used to identify the specific factors that allow ergonomics committees to achieve their goals. Interviews were conducted with 11 members of the ergonomics committee from various manufacturing companies.

Findings: Support for the committee's activities was indicated as one of the most frequently mentioned success factors of ergonomics cells, and this category was understood in a very broad way. It included organizational and financial support as well as personal support by people from within the organization. The adoption of a pro-ergonomic attitude by the organization requires employees at all levels to understand the benefits of such an approach and to use the adopted language of benefits.

Practical Implications: The results of the research can be used in the management of production companies in the correct organization of ergonomic committees and the management of success factors in the implementation of ergonomic projects.

Originality/Value: The conducted research contributed to the narrowing of the research gap concerning the boundary criteria for the implementation of ergonomics in enterprise management. This topic is taken up quite rarely due to its specific nature and the necessity to consider many inter-corporate relationships

Keywords: Success factors, ergonomic committee, ergonomic project management, pro-ergonomic approach in project management.

JEL Classification: J28, L20.

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1. Introduction

In manufacturing companies, an increasingly emerging trend is the implementation of ergonomic approaches to operational and strategic activities. This phenomenon is called ergonomic management, and its course may depend, for example, on factors related to the internal organization of the company, the organization of ergonomic activities as part of various projects and the involvement of employees in these activities (all employees and within ergonomic committees).

This article presents the results of the study of factors influencing the successful implementation of ergonomic projects, considering the activities of ergonomic committees established in enterprises. Ergonomic activity in production companies, apart from the obvious impact on the work environment, can be an effective tool for (re)organization of processes. By arranging many aspects related to the direction of changes implemented at workplaces, ergonomic aspects allow to obtain an added value, which is the participation of employees in the strategy implemented by the company. The ergonomic approach helps to understand the reasons for introducing changes in the organization of work and de facto enables humanization.

However, in order to benefit at an appropriate level from management through, it is necessary to find the rules for organizing this activity in the enterprise. Hence the need to search for good practices as well as the circumstances of their implementation, and thus the methodology of implementing ergonomics in enterprises. In certain situations, a small factor may determine the success of an undertaking, and failure to take it into account will expose the company to unnecessary losses as well as loss of credibility in the opinion of employees.

This article deals with the problem of good practices favouring the implementation of ergonomics in manufacturing companies in the context of success factors in organizing and maintaining the operation of ergonomic committees. Factors modifying (influencing) the effectiveness of the activities of these units were also taken into account. To investigate these issues, an analysis of the literature on the above-mentioned areas (with particular emphasis on macro ergonomic frameworks) was carried out and extended interviews were carried out among experts (participants of ergonomic committees), which were qualitative research.

The method adopted in this study is justified by the specific nature of the research subject, which is the formal and informal structure of the organization of activities related to the implementation of ergonomic changes at workplaces and the conduct of targeted projects in this area.

2. Implementation of Ergonomic Approaches in the Context of the Activities of Ergonomic Committees in Production Companies

The use of an ergonomic approach in an organization gives many benefits that the organization and its individual divisions can achieve in managing the quality of work (Górny, 2020), but also beyond this scope, especially in the industries where ergonomics

was not the key consideration (Suszyński, Butlewski, and Stempowska, 2017). Integration of ergonomics in the management system results, among others (collected by Domingues, Sampaio, and Arezes, 2012), efficiency and effectiveness improvement, bureaucracy decrease, costs reduction, objectives, processes and resources alignment, decrease in disruptions to plant operations, synergistic "energies" maximization, redundancies elimination, resources optimization.

Looking at the benefits to the labor system, there are also more mundane gains in areas such as (Hendrick and Kleiner, 2001), increased output per worker, reduced accidents, injuries, and illness, worker skill requirement, maintenance time, absenteeism etc. The search for an appropriate model to generate these profits is therefore justified, also because the relationship between safety, performance, occupational health, well-being, and quality is increasingly noticed (Carayon *et al.*, 2015). However, while many publications refer to the effects of adopting the ergonomic approach and macro ergonomic assumptions by enterprises, there are quite few publications referring to the factors of their effective implementation, i.e., the boundary criteria for the implementation of ergonomic approaches in the enterprise.

This article focuses on the implementation of ergonomic projects in the context of the activities of internal ergonomic committees. It can be concluded that the success of such activity is included in the quality of the result (meeting the initial assumptions of implementation and the requirements of stakeholders at various organizational levels of the enterprise). The basic criteria for assessing ergonomic projects can be considered elements of the so-called "the iron triangle" - quality, time, and cost, which determine the success of various activities of enterprises. Meeting these three conditions may qualify an ergonomic project as successful (Atkinson, 1999).

It should be noted, however, that the success of ergonomic activity in an enterprise will not depend only on the above-mentioned determinants, therefore, in its assessment, other criteria should also be determined (often depending on the type of implementation undertaken). An example of the extension of the basic criteria for considering the success of projects undertaken in organizations may be the presentation of the success factors of projects in the form of a quadrilateral, introduced by Atkinson (1999), in which, apart from the elements of "the iron triangle", other factors were also indicated, information systems (the quality of supporting the project), benefits for project stakeholders (added value in addition to meeting the basic requirements) and benefits for the organization from the project implementation (added value determining, for example, financial, company image or organizational benefits).

When considering the success of an ergonomic project, the elements of "the iron triangle" should also be juxtaposed with other factors, e.g., appropriate competencies of the project committee members, effective use of allocated resources, communication in the project, avoiding conflicts in the project group, using new trends in project management (Pollack, Helm, and Adler, 2018), and even with the sustainable development of the organization (Ebbesen and Hope, 2013).

It is also worth considering the approach presented by Caccamese and Bragantini (2013), who proposed to supplement the assumptions of "the iron triangle" with "soft" issues, which may also affect the success of projects, among which they indicated, the motivational dimension (support for the decision-making process, support for individual team motivations ensuring safe working conditions during project implementation), the social dimension (establishing the rules for organizing project activities, e.g., honesty, reliable preparation for meetings, punctuality) and the holistic dimension (causing internal motivation of project team members, performing tasks in a spirit of cooperation, ensuring respect for all ideas and individual approach to each participant of the project).

The above criteria, according to which it is possible to classify ergonomic projects in the context of success, indicate that they should be determined at the initial stages of implementation and adapted to the scope of the tasks provided, and additionally supplemented with factors strictly related to individual tasks within the project, e.g. the selection of ergonomic evaluation methods, selection of employees participating in analyzes, implementation of solutions in real conditions, including their integration with production processes (Gauthier and Lagacé, 2015; Attaianese and Duca, 2010).

In the case of ergonomic projects carried out under the supervision of ergonomic committees (whose functioning may be part of the implementation of the Participatory Ergonomics approach in the enterprise), aspects of the organization and operation of these committees may directly or indirectly affect the result of the activities undertaken and the subsequent classification of the project as a successful one (Albeeli, Tamrin, Guan *et al.*, 2017). These include selection of committee members taking into account their knowledge and competences, optimal determination of the rules of the committee's functioning in standard situations and in the event of the need to make unexpected interventions (also as part of projects), ensuring appropriate training of committee members taking into account the specificity of the company's operations, establishing principles of communication in the committee and also with management and lower-level employees, ensuring financial, technological and organizational support for the committee's activities, as well as determining the scope of powers and responsibilities (Ercan and Erdinc, 2006; Dutier, Guennoc, and Escouteloup, 2015).

Suboptimal management of the above-indicated factors may result in difficulties in the implementation of management through ergonomics in the enterprise, as well as incomplete use of the committee's potential and thus a reduction in the quality of ergonomic implementations (Horst, Broday, Bondarik *et al.*, 2015).

Among other factors determining the level of the achieved results from ergonomic implementations, the level of employee involvement may certainly be indicated in relation to other factors of work, such as working conditions or stress (Sadłowska-Wrzesińska and Mościcka-Teske, 2016; Koningsveld, Dul, Van Rhijn *et al.*, 2007). Organizational maturity, which is a conglomerate of various factors qualified in individual maturity models, is also indicated as a factor favoring this type of implementation in the enterprise (Mrugalska and Stasiuk-Piekarska, 2020).

Despite this, the literature lacks research related to the boundary criteria for the implementation of ergonomics as a factor of central implementation of changes in an enterprise, i.e., management through ergonomics. Due to the research gap discovered in this way, it was decided to further analyze the success factors of ergonomic activities carried out through the activity of the ergonomic committees in manufacturing companies.

3. Methodological Assumptions of Research

As part of the research, extended interviews were carried out with members of ergonomic committees in manufacturing companies or with persons acting as members of such committees, but without an appropriate formal name. It should also be noted that in many cases ergonomics is included in the competences of the occupational safety and health units. Meetings with focus groups were held in May-July 2021, in most cases they were attended by all persons involved in the committee's activity (in most cases, middle-level engineering and technical management and production workers involved in the work of the committee).

Meetings were held in remote and face-to-face mode due to the constraints of the Covid-19 pandemic. The questions were asked in two stages. In the first stage, the scenario of the Tug-Of-War method (Michalko, 1991) was used, which allowed for the determination of the subcategories of the success criteria of ergonomic committees. The usefulness of this method lies in its steps:

1. Description of the problem, which in the presented case was the efficient functioning of the ergonomic committee.
2. Description of the best possible scenario in each problem - the participants had to imagine that they were the best ergonomic committee in the world, which allowed to avoid defining and evaluating individual criteria of its functioning efficiency (which is, however, a separate and very interesting research problem regarding the assessment of organizational efficiency).
3. Similarly, to point 2- description of the worst possible scenario for the functioning of the ergonomic committee in the enterprise.
4. The most important step of the study was to determine the conditions for the course of each scenario, and then the scope of its modifiability, along with the specification of the characteristics and the expected value (maximant, minimant, optimant).
5. The final step was for the participants to determine on a 7-point (1- worst, 7- best) scale at what stage they are on the way to the expected value.

The summary of the Tug-Of-War method was the analysis of the possibility of shifting the fulfilment of individual conditions on the scales or indicating ways to eliminate the problems noticed, e.g., insufficient resources provided for the implementation of ergonomic measures or difficulties in organization of the activities of the ergonomic committee (Boatcaa, Draghicia and Carutasubp, 2018), however, due to the purpose of the study, it was decided not to present this step in this article.

In the next step of the study, the participants were asked to characterize the individual effects of the ergonomic committee's activity, considering all the circumstances relevant to the success of ergonomic projects on a 5-point scale (Definitely no; No; I have no opinion; Yes; Definitely yes). This qualitative analysis was necessary due to the nature of the research and allowed to define the boundary criteria for the success factors of ergonomic committees (in the context of the effects of their activities) in individual organizations. During the research, a dedicated questionnaire and sound recording devices were used, which allowed for the subsequent description of the results and presentation of conclusions.

4. Research Results

The results of the Tug-of-War analysis are presented in Table 1 along with the mean of the qualitative degree of fulfilment in terms of achieving the expected value. This data is purely indicative, both due to the nature of the averaged variable and the sample size.

Table 1. *The results of the Tug-Of-War analysis.*

No.	Name of the subcategory in the scenario under consideration	The average rating value of the scenario subcategory
1	The frequency of committee meetings	2,3
2	Organizational culture of the enterprise	3,3
3	Support for the committee's activities	4,0
4	The scope of the committee's powers (agency and decision-making)	3,7
5	The level of implementation of changes presented by the committee (management decisions)	3,7

Source: Own study.

Table 2 below presents the characteristics of the effects of activities (in the context of good practices) in the field of ergonomic committees functioning in enterprises.

Table 2. *Results of the survey on the effects of ergonomic committees' activities. Source: Own study.*

No.	Effects of the work of the ergonomic committee	Respondents' answers				
		Definitely no	No	I have no opinion	Yes	Definitely yes
1	Reducing the number of sick leaves caused by ailments related to working conditions		2	3	6	
2	Increased employee satisfaction with working conditions in terms of ergonomics		1	3	6	1
3	Greater involvement of employees in the issues of ergonomics			5	6	
4	A comprehensive approach to the management of ergonomic			4	7	

	activities (also as part of projects undertaken in the company)				
5	Improvement of production processes through ergonomic implementations	1	10		
6	Greater awareness of the importance of ergonomic working conditions among employees and management	2	9		
7	Supporting the management of production processes by applying knowledge in the field of ergonomics	2	9		
8	Development and application of the principles of ergonomic analyzes in the enterprise	4	6	1	
9	Creating the possibility of interaction between employees and the ergonomic committee	1	4	5	1
10	Avoidance of costs of low ergonomic quality of workstations	2	4	5	
11	Implementation of ergonomics in various projects carried out in the enterprise	4	7		
12	Additional benefits from the operations of the ergonomic committees, e.g., increased safety of employees	1	9	1	
13	Avoidance of costs related to the necessity to outsource ergonomic assessments	1	2	7	1

Source: *Own study.*

Due to the size of the research sample, the above-mentioned data are indicative and were used in formulating conclusions to supplement the data on the success factors of ergonomic implementations related to the functioning of ergonomic committees (in the context of the expected effects of their activity). The summary of the research is presented in Figure 1.

It should be noted that the above-presented approach to determining the conditions of the ergonomic commission's operation successfully assumes that actions will be taken to optimally shape all of the above-mentioned categories.

5. Discussion

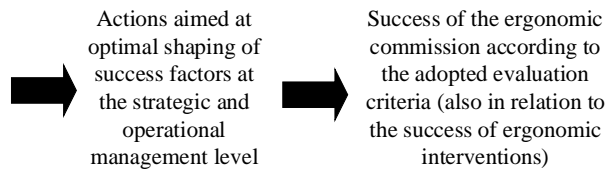
During the research with the use of the Tug-Of-War method, the participants independently designed the scenarios that were then assessed. As a result of these activities, 5 categories were identified in which it was possible to consider the success factors of ergonomic implementations (in the research sheets they were more detailed by

individual participants, which was not presented in the article). Members of the ergonomic committees indicated that an important factor in the organization of their activities is the determination of the optimal frequency of team meetings and the organizational culture of the enterprise in which they operate (including, friendly atmosphere, openness to ergonomic issues, communication).

Figure 1. The process of distinguishing the list of Success factors of ergonomic committee's performance within production companies.

Areas of identifying success factors of ergonomic committee performance in the context of ergonomic interventions in production companies:

- approach to project management in enterprise (organization and supervision),
- organizational culture in the enterprise,
- organization of the ergonomic committee's activities,
- support for ergonomic committee's activities (e.g. resource allocation, management interest),
- communication in the activities of the ergonomic committee (also in the context of cooperation with employees of various workplaces),
- adopted approach to performing ergonomic interventions (including methods of analysis, reporting results, implementing ergonomic solutions).



Source: Own study.

Other aspects were supporting the committee's activity (including technological, financial, organizational support), providing the committee with an appropriate level of decision-making (sense of agency) and acceptance by the company's management of ideas for ergonomic implementations. Average ratings of the respondents in the scenarios indicate that in the enterprises in which they operate, actions should be taken to shape the indicated factors towards the best possible scenario (as long as it is defined in the enterprise and understood in the same way by all members of the ergonomic committee). This can support management through ergonomics and positively affect the quality of ergonomic implementations.

The developed Tug-of-War scenarios can be extended with other success factors of ergonomic implementations, and their analysis by ergonomic committees can be the basis for determining their optimal level and determining at what stage the company is in its pursuit of achieving them (defining the boundary conditions of ergonomic activities and managing the indicated factors in order to achieve and maintain their appropriate level).

In the context of achieving the above-mentioned assumptions, it may be helpful to define the expected results of the ergonomic committees' activities. This allows to indicate the direction in which projects undertaken by these committees should go, but also in a broader sense, activities undertaken throughout the organization in the context of implementing management through ergonomics. As shown by the results of research on the effects of ergonomic committees, they are noticed by team members and can be the basis for directing activities towards their achievement.

6. Conclusions

It can be concluded that the implementation of various ergonomic projects and solutions in modern production companies is a common practice, resulting from the need to optimize processes and adapt them as best as possible to the capabilities of employees (as part of the constantly developing humanization of work despite progressing automation).

However, there is a difficulty in implementing a more systemic approach to management through ergonomics, which may be due to the multitude of factors determining the success of the implementation of ergonomic solutions and the difficulty in determining their optimal level. For this reason, the conclusions from scientific research on these factors can be used to identify this issue in greater detail and can be used in companies to develop ergonomic strategies that allow for optimal performance in planned projects, but also ensure resilience in this regard in unforeseen situations (exemplified by the Covid-19 pandemic and related changes in the functioning of enterprises).

The results of the scientific research presented above may be developed in the future towards assessing the importance of the factors of the success of ergonomic implementations and determining the relationships between them, which may lead to proposing models of managing ergonomic activities adapted to the specificity of enterprises and changing conditions of their functioning.

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