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Practical Aspects of the Organization of Ergonomics Committees in the Context of the Quality of Ergonomic Activities Undertaken in Manufacturing Enterprises

Keywords: ergonomics committees; ergonomics management; participatory ergonomics; ergonomic quality

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Abstract

Theoretical background: In order to systematize ergonomic activities in the enterprise, some of them decide to establish ergonomics committees whose task is to solve problems in this area and also to propose new, often innovative solutions for implementation. The structures of these units often include employees from different departments who have a different view of ergonomics depending on the position they hold. However, the organization of ergonomics committees can cause many problems due to the lack of top-down guidelines for their activities (each company must establish its own rules). In scientific research on the ergonomic aspects of projects, there is a tendency to look for factors that favor the diffusion of ergonomic issues in their implementation. One such factor may be the creation of an ergonomics committee to pursue ergonomic goals. Their activities are not described in detail in the literature (there are no practical guidelines for their functioning), which is why the topic is discussed in this article.

Purpose of the article: The main goal of this article is to present propositions for actions that can be taken to systematize the functioning of the ergonomics committees and to link this task with the quality of ergonomics management in manufacturing enterprises. The aim of the article is also to describe, using

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a practical examples, various aspects of the operation of ergonomics committees and to indicate guidelines for their establishment and activities. Thus, the article aims to fill the research gap in the field of creating ergonomics committees.

Research methods: The research used the interview method with participants of ergonomics committees from companies from various industries. The questions were asked in the following groups: organization and functioning of the ergonomics unit in the enterprise and assessment of the effects of the ergonomics team's activities. The respondents were participants of the ergonomics committees, which was appointed at least 2 years earlier, the industries represented by the respondents are: automotive (2 companies) and furniture production. Data obtained in three selected enterprises (through informal interviews) where such committees operate, as well as a literature review in this area, were used to formulate these suggestions. The results of the undertaken research allowed for the identification of practical aspects of the functioning and organization of the ergonomics committees. This is an innovative area of research due to the fact that few scientific studies describe such units and guidelines for their practical implementation.

Main findings: The main result of the undertaken research was to indicate the categories in which the activities of ergonomics committees should be considered and to provide practical guidelines for their activity. These guidelines are presented as structured areas for consideration when establishing an ergonomics committee: (1) establishing the principles of operation and reporting; (2) determining the composition of the committee; (3) determining the scope of activity of the committee; (4) providing appropriate training for committee's representatives; (5) support for the committee's activities. The most important conclusion from the undertaken research is the indication that each enterprise must plan the operation of the committee taking into account its internal conditions. The conclusions from the conducted research were supplemented with indications of directions for further research into the conditions for the functioning of ergonomics committees in manufacturing companies.

Introduction

Many scientific studies point to the interdisciplinarity of ergonomics. The application of its principles is related to many areas of work organization, including: optimal design of workplaces, spatial planning, human resources management, labor economics and occupational safety (Safin et al., 2020, pp. 925–929; Mulaomerovic & Wang, 2023, pp. 2–6) and recently also with the dynamically developing area of implementation of artificial intelligence into processes (Sawyer et al., 2021, pp. 1390–1405; Greco et al., 2020, pp. 7765–7774). Such a broad consideration of ergonomics may be a factor favoring its use in modern manufacturing enterprises (multidimensional impact is possible to improve working conditions), but, on the other hand, it may cause problems (including in the area of prioritization of problems to be solved, the choice of the method of assessing ergonomics or searching for ways to motivate employees to participate in such projects) (Abdous et al., 2022, pp. 695–697; Reiman et al., 2021, pp. 4–9). Therefore, ways to properly manage ergonomics in enterprises are being sought, including: the use of the macroergonomics approach, systemic shaping of ergonomics at the level of the entire enterprise, proactive management of ergonomic activities or the use of participatory ergonomics – PE (Guimarães et al., 2015, pp. 98–105). One form of PE may be the appointment of ergonomics committees within the company's structures, which through their activities implement the ergonomic goals and tasks set in the company. There is no established framework

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for organizing the work of such units – it depends largely on the specificity of the enterprise and its processes as well as the resources provided to the committee. This article presents the practices of organizing such groups on the example of three selected enterprises and literature data. The conclusions from the research were used to determine the directions for its further development (including the development of guidelines for the commission's activities at the operational and strategic level).

Literature review

Ergonomics in manufacturing companies

Over recent years, there has been an increase in interest in various enterprises in implementing the principles of ergonomics, which is defined as the science of adapting the work environment to human capabilities (Tosi, 2021, p. 16). This may be due to the changing conditions of the functioning of companies (including in the context of legal requirements that impose specific principles of shaping the employee's workload, but also due to the aging of the society and paying more attention to the employee's psychophysical condition and promoting work-life balance) (Marhaendra, 2023, pp. 576–583; Strasser, 2017, pp. 2–6). The principles of ergonomics are usually universal and apply to various areas of employee functioning, including: postures adopted at work, lifting loads, precision work, e.g. performed with strain on the wrists and shaping the working conditions of standing and sitting works. It should be noted, however, that they must be adapted to the specific nature of the enterprise, especially if manufacturing enterprises are considered. In the case of such a business profile (requiring constant adaptation to changing internal and external environmental conditions), it is necessary to ensure the integration of technological development of production processes and ergonomic activities, which means a long-term look at ergonomic implementations (frequently changing customer requirements result in the need to quickly re-equip workstations) (Bortolini et al., 2020, pp. 1–7). On the other hand, however, an appropriate approach to introducing ergonomics to production workstations may result in benefits that are not observed in non-manufacturing enterprises, including: introducing innovative ergonomic technical solutions, avoiding the costs of non-ergonomic working conditions and employee ailments, increasing productivity and efficiency of processes, or reducing the burden on employees performing physical work (Naca et al., 2016, pp. 2–4; Weckenborg et al., 2022, pp. 682–684).

Management of ergonomic activities in manufacturing enterprises

Management of ergonomic activities in enterprises involves identifying employees responsible for their implementation, determining appropriate resources and monitoring their results in order to determine the degree of achievement of the

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assumed goals and to take possible corrective actions in the adopted assumptions (they may, for example, refer to: implementation time, achievement of assumed goals, costs incurred to implement the proposed solutions) (Zarrin & Azadeh, 2019, pp. 141–143). To accomplish the above-mentioned tasks, companies introduce different approaches to ergonomics management (at the level of the entire enterprise but also in relation to individual pro-ergonomic activities). One of them is a systemic review of ergonomic working conditions, which includes: work organization (work processes, organization of tasks, employee workload), systems and interfaces (implementation of ergonomics into the everyday functioning of the company) and employees whose involvement is necessary to implement the principles of ergonomics (they have the best knowledge about their workstation) (Wilson, 2014, p. 9). This approach allows for a multidimensional view of the organization of ergonomic activities, which may facilitate better diffusion of the results of such implementations in work processes and among employees (they will be aware of the need for changes and the benefits that new ergonomic solutions will provide them) (Fernandes et al., 2015, pp. 4510–4513). Considering ergonomics from many points of view is also supported by the application of the assumptions of macroergonomics, the basis of which is the shaping of socio-technical systems by characterizing these systems and their individual parts, as well as detailed design of workstations and relationships: man–environment–machine–software (Yener, 2019, pp. 85–86). The essence of implementing the macroergonomic approach is shown in Figure 1.

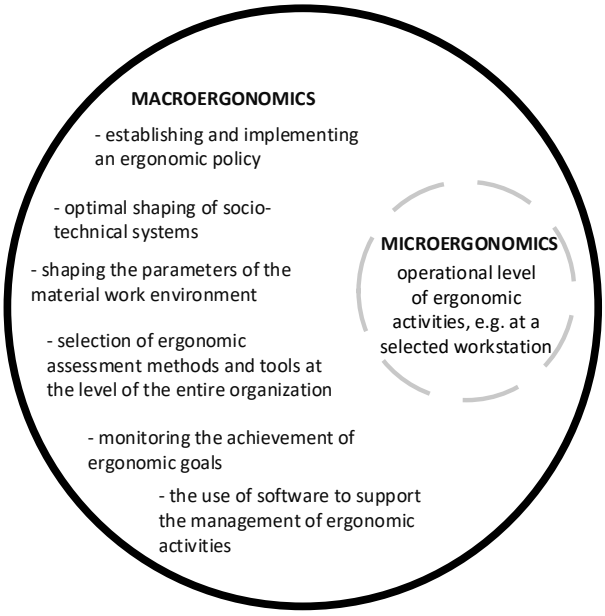


Figure 1. Activities in the macroergonomic approach

Source: Author's own study based on: (Smith et al., 2019, pp. 924–927).

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One of the components of the implementation of the macroergonomic approach in the company is to establish methods for carrying out ergonomic assessments depending on the assessed process and the employee's workload. It is also important to follow the basic principles of ergonomic assessments (including in terms of observation time, selection of a research sample and presentation of results) (Butlewski et al., 2019, pp. 130–140) and use macroergonomic analysis tools, e.g. Macroergonomics Analysis and Design (MEAD), Organizational Requirements Definition for Information Technology Systems (ORDIT), Ergonomic Work Analysis (EWA) (Rocha et al., 2023, pp. 3–4). It is also important to look for ways to involve employees in ergonomic activities – this may help improve the quality of these activities (employees have the best knowledge about their workstations) and better acceptance of the proposed solutions (Fernandes et al., 2015, pp. 4513–4516; Visser et al., 2019, pp. 43–49).

Ergonomic committees – organization of their activities and their tasks

Using the Scopus database and using the keyword "ergonomics committee" in the years 2013–2023, 126 articles can be identified. Their analysis indicates that only few scientific papers concern such committees. A summary of their review is presented in Table 1.

Table 1. Summary of a literature review on different approaches to ergonomics committees

Author/s and year of publication	Ergonomics committee's context
Yamada et al., 2022	Activities of the SciComm Committee in the context of good ergonomics practices in scientific research in Japan.
Horowitz et al., 2022	The activities of the ergonomics committee in the radiology industry, which aimed to reduce repetitive stress injuries (RSIs).
Rawan et al., 2022	Guidance for ergonomics committees on selecting methods and conducting ergonomic analysis of workplaces.
Guérin, 2022	An example of an ergonomics committee (Ergo@Large) created in the Canadian market with the aim of applying new ergonomics approaches.
Choobineh et al., 2022	Example of an ergonomics program in which working groups (equivalent to ergonomics committees) were involved.
Ghahramani et al., 2019	An example of the formation of a commission for Technical Protection and Health at Work, which was intended, among others, to achieve ergonomic goals.
Aslanides et al., 2019	A summary of existing training programs for people and groups dealing with ergonomics in companies from various industries.
Nobrega et al., 2017	An example of the Total Worker Health® (TWH) program, which established committees dealing with safety, well-being and ergonomics. It contains detailed guidelines for creating such groups.
Fernandes et al., 2015	Example of an evaluation of an existing ergonomics program in which an ergonomics committee was established.

Source: Author's own study.

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The activity of the ergonomics committee is aimed at structuring ergonomic tasks undertaken in various areas of the company's operation. Typically, employees from various departments of the company who have knowledge of work processes and the organization of workstations are appointed to its structure. The areas of activity of the ergonomics committee are shown in Figure 2.

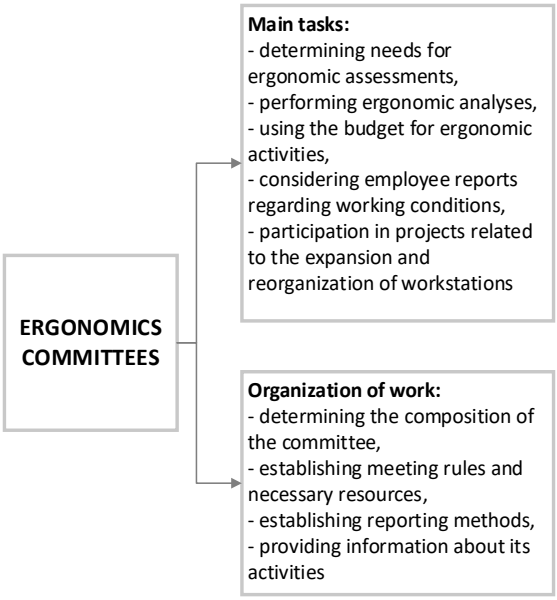


Figure 2. Basics of organizing the ergonomics committee

Source: Author's own study based on: (Sundstrup et al., 2020, pp. 589–592; Czernecka, 2021, pp. 12070–12074).

It is important to note that the activities of the ergonomics committee must be structured and management should provide adequate resources for its operation. These resources include: technical support, providing adequate time to participate in ergonomic activities, providing channels for communication with employees, and providing appropriate means of upskilling necessary to serve on the committee. For this reason, the committee's activities require the involvement of lower-level employees (reporting problems and constant contact with committee members) and higher-level employees (support, accepting proposed improvements and monitoring results) (Czernecka & Butlewski, 2021, p. 442). Based on the above indicated literature review, the existence of this research gap can be demonstrated: there are few scientific studies on the organization and functioning of ergonomics committees in manufacturing enterprises and the lack of current, practical guidelines for their implementation.

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Research methods

As part of the research undertaken, interviews were conducted with representatives of various production companies. The following research questions were adopted in the undertaken research: (1) what are the conditions for the activity of the ergonomics committee in a manufacturing company? (2) to what extent do participants of the ergonomics committee participate in ergonomic projects undertaken in the manufacturing company? (3) how ergonomics committees are organized in manufacturing enterprises of various industries? The research scheme is presented in the Figure 3.

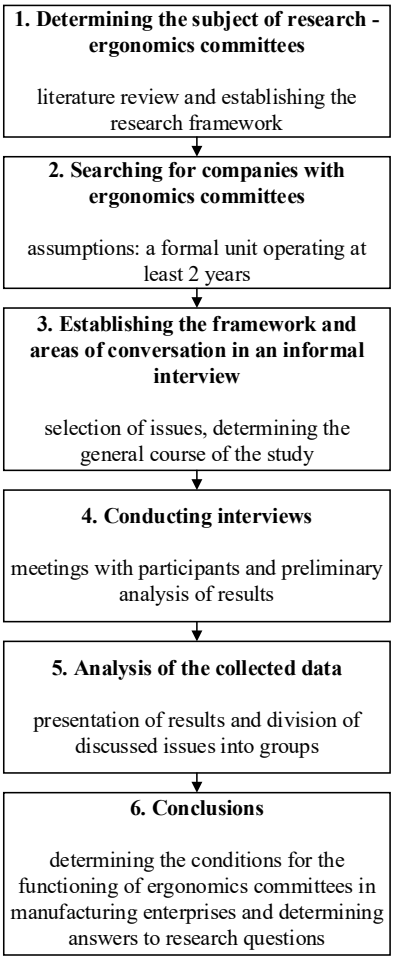


Figure 3. Research cycle and methodological approach

Source: Author's own study.

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The research was conducted in the form of an informal interview based on a developed scenario (Swain & Spire, 2020, pp. 5–6). The questions concerned the following issues: organization and functioning of the ergonomics unit in the enterprise and assessment of the effects of the ergonomics team's activities. The respondents are participants of the ergonomics committees, which has been operating for at least 2 years, the industries represented by the respondents are: automotive (2 companies) and furniture production. The research was conducted through a direct meeting with the respondents (the advantages of this solution are: asking questions in accordance with the scenario and current interpretation of the answers obtained, reacting to the answers and behavior of the respondent depending on the development of the research course, learning the specifics of the case under study also by obtaining contextual information). Respondents answered questions regarding:

– organization of the committee's work,
– general functioning of the committee in the company structure,
– activities undertaken by the committee as part of various projects undertaken in the company.

The collected data were presented in a summary table (Table 2) and then supplemented with data from a literature review in order to propose good practices in the organization of such committees that may affect the quality of ergonomic activities undertaken.

Results

As part of the interviews, information was obtained about the organization of selected ergonomics committees and their tasks and functioning. The results are presented in Table 2.

Due to the topic of the article and in order to increase the readability of the presentation of the collected data, Table 2 presents a summary of the most important results obtained during the study.

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Table 2. Summary of the results of interviews conducted with participants of the ergonomics committees

Question area	Obtained data	Enterprise 1 – production	Enterprise 2 – automotive	Enterprise 3 – automotive
General information	Data about the committee	Furniture production, 950 employees, the committee has been operating for 4 years, staff: occupational health and safety and ergonomics specialist, process technologist, process engineer, 2 production workers	Automotive industry, 700 employees, the committee has been operating for 3 years, staff: ergonomics specialist, technologist, representative of production employees	Production of car components, 2,500 employees, the unit has been operating for 2.5 years and consists of 1 person (ergonomics specialist)
	Objectives of the committee's activities	Ongoing ergonomic assessments	Improving ergonomics, supporting the health and safety department	Committee required in every unit of the company
Functioning of the committee in the company	Operating regulations	Committee's activity described in the general ergonomic procedure	Committee's activity described in the general ergonomic procedure	The activities of the committee described in the global (at the company level) ergonomics policy
	Organization of meetings and work of the committee	Regular meetings every 2 months; intervention meetings in the event of important employee reports	Regular meetings once a month; no meetings in the event of urgent employee reports	Regular meetings of a single-person committee with the occupational health and safety department (high dependency of these two units)
	Reporting the results of ergonomic activities	Report submitted after each project; no periodic reporting to top management	Once a month, a report is sent to managers and the director	Periodic meetings with top management where results are reported
	Trainings	Training with an occupational health and safety and ergonomics specialist (before setting up the committee)	Training with an external company in conducting ergonomic assessments; taking part in conferences	Lack of organization of training
	Support for committee activities and communication	Company level information; available budget; perceived lack of management support in activities	Company level information; available budget; great support from management in activities	Company level information; available budget; great support from management in activities – acceptance of ideas for ergonomic improvements
Results of implemented projects in the field of ergonomics	Ergonomic goals in relation to various projects implemented in the company	The commission is not involved in all production projects; determining the necessary resources (including financial resources for each project); establishing ergonomic goals in each undertaken production project; project management methodology used: SCRUM	The committee is not always involved in projects related to production; determining the necessary resources (including financial resources for each project)	The committee is involved in all projects related to production; determining the necessary resources (including financial ones for each project); project management methodology used: Confluence

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Question area	Obtained data	Enterprise 1 – production	Enterprise 2 – automotive	Enterprise 3 – automotive
	Ergonomic analyses carried out	Application of selected ergonomic assessment methods; lack of additional, dedicated data collection programs; implementations based on the results of ergonomic assessments and taking into account the company's capabilities	Application of selected ergonomic assessment methods; lack of additional, dedicated data collection programs; implementations based on the results of ergonomic assessments and taking into account the company's capabilities	Application of selected ergonomic assessment methods; data is entered into Excel (no additional, dedicated programs); implementations based on the results of ergonomic assessments and taking into account the company's capabilities
	Employee involvement in assessed workplaces	Participation of employees at every stage of project implementation (from identifying needs to implementing ergonomic solutions and training in their use)		
	Criteria for assessing the implementation of ergonomic activities	– implementation within the assumed time and using the planned resources (e.g. financial), – implementation of all goals set during project planning, – acceptance of the solution by users, – increasing employee awareness of ergonomics, – reducing ergonomic risks, – additional benefits, e.g. increased employees' safety	– implementation within the assumed time and using the planned resources (e.g. financial), – implementation of all goals set during project planning, – acceptance of the solution by users, – reducing ergonomic risks, – additional benefits, e.g. increased employees' safety	– implementation within the assumed time and using the planned resources (e.g. financial), – implementation of all goals set during project planning, – meeting stakeholder requirements, – improvement of the work process, – acceptance of the solution by users, – additional benefits, e.g. increased employees' safety

Source: Author's own study.

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Discussions

Although establishing ergonomics committees is not yet popular in Polish enterprises, their functioning can bring many benefits to improve the organization of ergonomic activities (Czernecka & Butlewski, 2021, pp. 444–445) and, therefore, the quality of their implementation at workplaces. However, the level of this quality will depend on the appropriate preparation of the company for the implementation of the ergonomics committee. Based on the interviews conducted, several areas can be identified that should be taken into account when organizing the work of such a committee:

1. Establishing the principles of operation and reporting – development of an ergonomics policy in the company; developing instructions for the functioning of the committee and templates of reports and other documents related to its activities; determining the frequency and form of meetings and situations in which the unit should be appointed (e.g. projects, consideration of employee applications, emergency appointment).

2. Determining the composition of the committee – appointing employees who perform tasks related to ergonomics and representatives of other departments where ergonomic problems occur (especially production); technical staff and technologists should also be involved.

3. Determining the scope of activity – the scope of activities to be performed by the ergonomics committee should be determined, e.g. ergonomic assessment, solutions design, evaluation of solutions or prototypes implemented at workplaces; activities should be performed with the participation of employees of the assessed workstations, criteria for assessing the implemented ergonomic solutions should be established for each implementation.

4. Providing appropriate training – the company should provide external and internal training for the ergonomics committee, covering the following areas: ergonomic assessments, project management, soft skills necessary for contact with employees.

5. Support for the committee's activities – technical support (e.g. software), accommodation of committee participation in the work schedule and management support (regular meetings with the committee, monitoring of results, discussion of current ergonomic problems) should be provided; it is also important to ensure appropriate channels of communication between the committee and all employees.

The organization of the above-mentioned areas requires taking into account the company's capabilities in terms of resources and knowledge in the area of ergonomics (which may need to be supplemented through external training or participation in industry conferences). In some cases, detailed training of the ergonomics committee on how to perform ergonomic assessments may be required (if there is no one within the company who has the appropriate knowledge in this area). It is also important to build employees' soft skills, which will influence the committee's ability to co-

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operate with employees at various organizational levels of the company. Supporting the committee's activities may require setting a budget that will include the costs of such training, but also the costs of conducting ergonomic analyses and implementing technical and organizational solutions on this basis.

Conclusions

Scientific literature on ergonomics points to the problem of incomplete use of the potential of implementing its principles into work processes and ensuring high quality of the proposed solutions (especially in the production sphere). This may be due to dealing with ergonomics in an unstructured form – it is often taken into account when implementing other projects, and companies do not develop ergonomic guidelines for each implementation. The answer to noticing these problems may be to establish ergonomics committees within the company's structures, which will carry out ergonomic tasks based on the developed policy and documentation templates. Based on interviews conducted in three companies where such a committee operates, it can be concluded that its activities should be undertaken within strictly defined frameworks, including: in the context of work organization, providing support and training, and establishing reporting methods. This may support the development of a unique approach in the company to the implementation of ergonomic activities and thus improve their quality and increase the usefulness of the achieved results (including in terms of proposing solutions that respond to real problems noticed at workplaces). Of course, it should be noted that research on the implementation of the ergonomics committee should be further expanded, e.g. towards the development of universal or adaptable guidelines for enterprises on the organization of their activities. An interesting direction of research also seems to be examining the relationship between the functioning of the committee and the internal situation of the company, e.g. the adopted project management methodology.

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