SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2024
ORGANIZATION AND MANAGEMENT SERIES NO. 192

HEALTH AND SAFETY MANAGEMENT IN THE ERA OF BUILDING SOCIETY 5.0

Agnieszka GOŹDZIEWSKA-NOWICKA

Bydgoszcz University of Science and Technology; agnieszka.gozdziewska@pbs.edu.pl,
ORCID: 0000-0001-5949-3901

Purpose: The purpose of the article is to make a detailed characterization of the cybernetic system of man-machine-environment in the context of maintaining occupational health and safety.
Design/methodology/approach: Data for the study was collected using participant observation. Subsequently, any information obtained is presented in this paper as a case study.
Findings: The results of the study indicate that occupational health and safety management in the era of building society 5.0 is highly dependent on the proper cooperation of man and machine in a turbulent work environment.
Research limitations/implications: The survey is limited to employees of one manufacturing company. Therefore, it would be extremely valuable to observe whether work safety in other companies also depends primarily on the proper preparation of workers to work with machinery.
Practical implications: The study provides guidance for human resource management to implement effective practices to enhance employee safety in the era of building society 5.0.
Social implications: This study offers support to the employees of a manufacturing company, providing insight into how the work environment can be improved, thereby increasing health and safety.
Originality/value: This is a study that aims to provide insight into how, in the era of building a 5.0 society, it is important to take care to prepare the employee to be a designer of a safe work environment in which people and machines work together to achieve the best work result.
Keywords: health and safety management, ergonomics, society 5.0.
Category of the paper: research paper.

1. Introduction

The era of building society 5.0 is characterized by the presence of strong synergies between humans and machines. The technologies are being designed to be more human and understandable, which facilitates communication between humans and automation systems. In the context of worker health and safety, the human-worker cybernetic system is a very important issue. It refers to the design of jobs and tasks so that they are tailored to the needs,

capabilities and limitations of workers. One of the key goals of employee safety management in the era of building a 5.0 society is to create work environments that support employee health, comfort and productivity (Avilla-Gutierrez et al., 2022). By implementing automated solutions that help with both professional work and daily tasks, the quality of life and well-being of society improves. However, it should not be forgotten that digital technologies are changing the way we work and require new skills, such as programming, data analysis and data management. In a 5.0 society, there is a strong emphasis on continuous education and skill development so that people can adapt to the rapidly changing technological environment.

The purpose of the article is to make a detailed characterization of the cybernetic system of man-machine-environment in the context of maintaining occupational health and safety. In the era of the creation of society 5.0, there is nothing more valuable than the creation of effective and efficient health and safety management systems in companies.

2. Health and safety management system

Research conducted by the European Foundation for the Improvement of Working Conditions in seven European Union countries shows that the primary driver of efforts to improve worker health and safety is legislation. They are the ones that provide a framework for workers to enjoy a high level of health and safety in the workplace (Occupational safety and health in Europe, 2023).

These studies also show that actions to improve working conditions work are taken with a view to increasing productivity and improving the quality of work, creating a positive image of the workplace and raising employee motivation. There is also a growing awareness of losses caused by accidents and absenteeism among employees.

Analyzing legal regulations in the field of health and safety, which also in Poland should be considered the main stimulator of efforts to improve occupational safety and health protection of employees, it can be concluded that in every enterprise should function, more or less formalized, a system of managing occupational health and safety. The way in which the occupational safety and health management system is designed, functions, as well as its effectiveness, may vary from one enterprise to another (Goździewska-Nowicka, 2019). This is determined by obvious considerations, such as the size, the nature of the organization's activities, its operating conditions and the categories of employees employed. Very important here is the level of safety culture characteristic of a given enterprise.

The approach of enterprises to occupational health and safety is well presented by M.B. Weinstein. He distinguishes four levels of occupational health and safety management in enterprises (Tabele 1). From activities motivated only by fear of penalties for non-compliance with regulations to a focus on continuous improvement of the state of health and safety and occupational health.

Table 1.
Levels of occupational health and safety management in the enterprise

	Level I	Level II	Level III	Level IV
Motivation to act	Fear	Punishment	Award	Motivation internal
Type of action	Passive	Reactive	Active (understanding and trust)	Proactive (passion and commitment)
Typical evaluation method	Only inspections of supervisory institutions	Documentation analysis, inspections	Observation of workplaces, audits of the system health and safety management	Reviews and interviews, results work
Typical training	Only courses basic	Courses, instruction and checking	Thorough instructing and support	Based on examples, self-improvement
Typical health and safety objectives	Avoidance Penalties and fines	Avoidance of noncompliance	Performing all work correctly	Zero accidents, best methods
Results achieved in the area of health and safety	Incomplete compliance, performance worse than averages	Compliance, lack of improvement, average performance	Correct behavior, performance than average	Continuous improvement, leadership, results excellent

Source: own compilation based on Weinstein, 1997, pp. 34-35.

The approach to occupational health and safety management corresponding to levels I and II is referred to as traditional or reactive, while the approach corresponding to levels III and IV is referred to as systemic and proactive, as it is related with the implementation of a specific management system of resources, activities and processes in the enterprise aimed at continuous improvement of health and safety at work (Legg et al., 2015). The first two levels characterize enterprises in which work and safety issues are treated marginally, as unimportant (but necessary due to applicable regulations) area of activity. The number and quality of activities undertaken here are limited to the extent of avoiding sanctions for failure to meet regulatory requirements, and their main purpose is to reduce expenditures. Levels III and IV signify a change in thinking about safety and health protection of the employed. Taking care of the health and safety of employees is an investment that pays off (both in terms of social and economic). This attitude toward work and safety is characteristic of organizations that treat occupational health and safety on an equal footing with other areas of their business.

Observation of business practice reveals that more and more companies are adopting practices characteristic of Level III and IV. Many organizations are interested in taking systematic measures to improve the state of occupational health and safety. This is accompanied by the belief that the effectiveness of these activities requires that they be carried out within the framework of a structured occupational health and safety management system implemented and maintained in these organizations.

The International Labor Organization defines an occupational safety and health management system of occupational safety and health as a system of interrelated and interacting elements for establishing occupational safety and health policies and objectives and the achievement of these goals (Vaughan-Whitehead et al., 2021). In contrast,

PN-ISO 45001:2018-06 defines the system as part of an organization's overall management system, which includes the organizational structure, planning, responsibilities, policies, procedures, processes and resources needed to develop, implement, execute, review and maintain a health and safety policy (Rączowski, 2022).

Companies can build and develop health and safety management systems on their own, and there is nothing to prevent them from being effective and efficient. Of course, their shape will be significantly influenced by regulations in force in this area. However, the way they approach safety and health issues (passive or active), the type of measures taken (only what the law prescribes or also voluntary initiatives), the methods used to achieve the goals set, to solve the problems that have arisen depend on the enterprise.

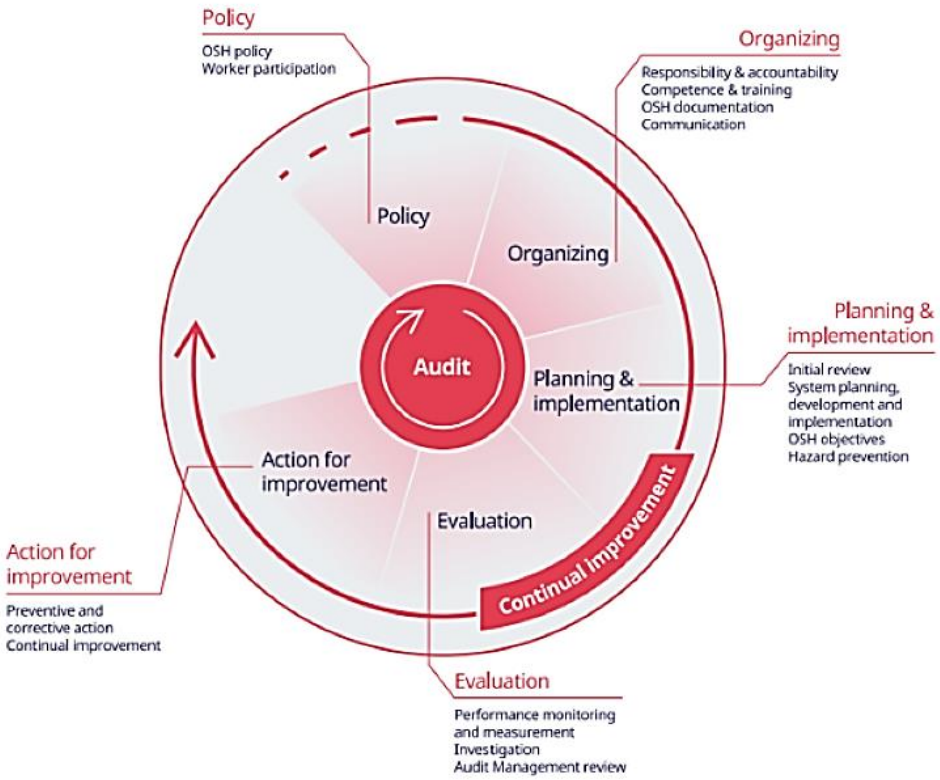

Figure 1. Occupational Safety and Health Management System Cycle.

Source: Vaughan-Whitehead, Ghellab, Munoz de Bustillo Llorente, 2021, p. 124.

The safety and health management system model is based on the concept of continuous improvement. Organizations implementing an occupational health and safety management system in accordance with this model must establish an occupational health and safety policy and objectives, plan activities to achieve them, create appropriate conditions for carrying out these activities, check their effects, take preventive and corrective actions in response to nonconformities revealed, and continuously improve the system, by carrying out periodic reviews to check its suitability and effectiveness in terms of the organization's established safety and health policies and objectives and occupational health and safety (Ghkobakhloo et al., 2022).

The guidelines and requirements set forth in the standards hit different ground. The result is the development of different occupational health and safety management systems work (although built on common foundations defined by the standard). The success of an occupational health and safety management system will be determined by the proper, adapted to the particular organization the way in which these requirements are met. The most important thing is that more and more entities recognize the need for proper management of the health and safety area and continuous improvement in this matter (Tepe, 2021).

3. New era man – society 5.0

The Japanese define society 5.0 as a model of of human-centered relations (human-centric society). It uses economic progress to solve social problems through a system and technology that strongly integrates cyberspace with the physical, real space. It is a society characterized by a higher level of integration, the interpenetration of the two realities - digital with real - facilitating the embedding of cyberspace in the real world. Such a society can also be called a super-intelligent society or creative society. This is another society, after the hunting society, agrarian society, industrial society or finally information society, that we exists today. Figure 2 presents the stages of creating society 5.0.

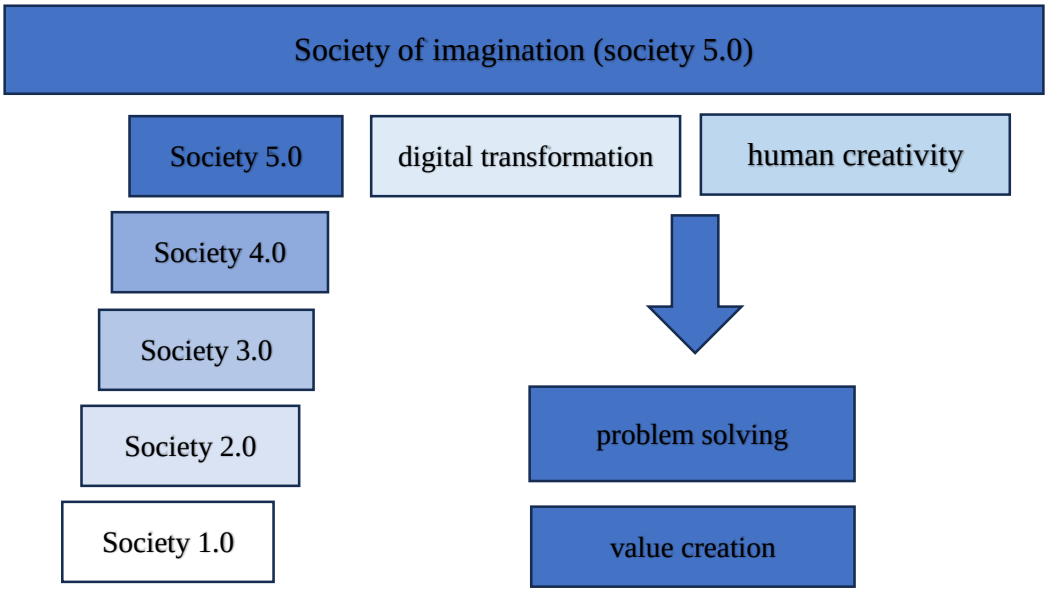

Figure 2. Factors for building society 5.0.
Source: Twaróg, Mieczkowski, 2019, p. 28.

The Japanese government did the analysis and, based on that, developed the Fifth Science and Technology Base Plan, which was adopted in January 2016 (Hayashi, 2019). The plan calls for a transition from Industry 4.0 to a society 5.0, in which all aspects of society, including industrial work, is shaped by the latest techniques and technologies. Japan has had to develop a new model for how society operates, as it is experiencing problems related to energy shortages and energy imports from abroad, limited natural resources and an aging population. One of the main ideas of policymakers is to use artificial intelligence (AI) to solve long-term problems (Ricciolli, 2023).

The basis for the development of Society 5.0, according to the Japanese government, should be: Japan's Revitalization Strategy, as well as the Economic Growth Strategy. New economic growth will come through the development of artificial intelligence and the further robotization of society and automation of industry with ubiquitous superfast communications. It is in advanced techniques and technologies is where the Japanese government has placed its greatest hopes for development and hopes to further increase productivity and the well-being of society. In doing so, it has emphasized the role of software, which should be developed in parallel with the development of hardware and robotics. With an aging population, it is AI and robotics that are expected to play a significant role in improving medical care, as well as support local companies, in view of the shortage of workers in Japan's transportation sector (Shujiro, 2021).

In society 5.0, the world of people, machines and all their surroundings are connected and able to communicate with each other. The concept implies something more than the Internet of Things environment that has been announced for years. Society 5.0 - a super-intelligent society - may be the ultimate bridge between machine and human. The technologies that have determined Industry 4.0 AI, robotics, 3D printing and digital platforms are changing the job market and the demand for individuals. The current generation is set for a more personalized future thanks to the adoption of artificial intelligence algorithms. Digitization, as well as digitalization, is undoubtedly continuously merging the real and virtual worlds, becoming a major driver of innovation and change in all sectors of our economy. The exponentially increasing amount of data and the convergence of various affordable technologies that have emerged with the definitive introduction of information and communication technologies are transforming all areas of the economy (Mohd, Abid, 2020).

One of the hallmarks of society 5.0 will be a changing labor market and worker competencies. Industry 4.0 is having an impact on work and competency profiles, and as a result, new competencies will be needed among employees. Technical competencies will become much less important in the future, and personal skills will become more critical. Figure 3 presents the competence needs of the 4.0 and 5.0 era.

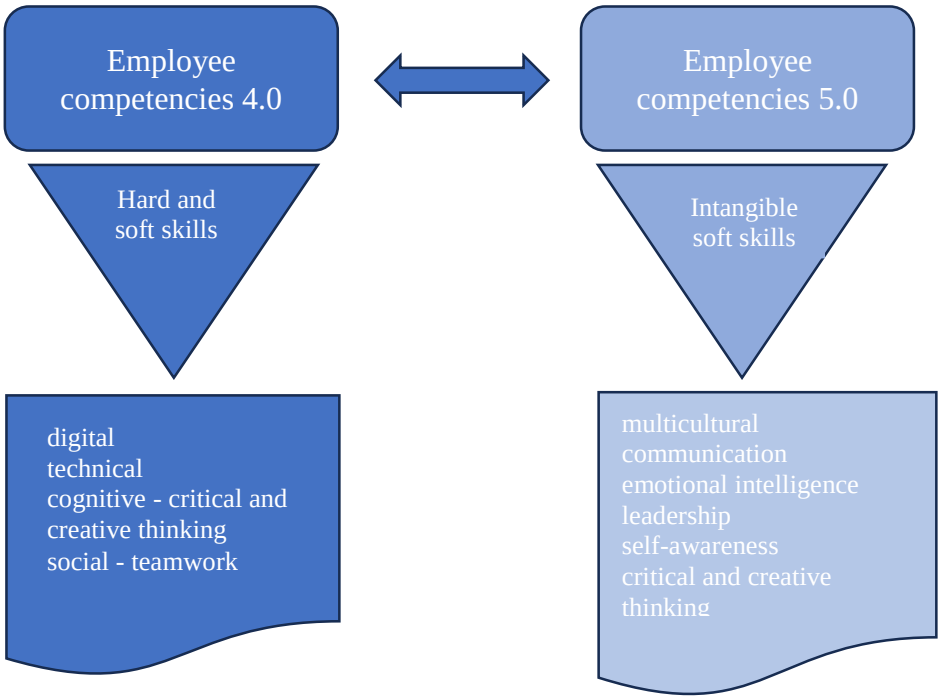

Figure 3. Competency needs of the 4.0 and 5.0 era.

Source: own study.

Analyzing the summary shown in Figure 3, it can be seen that competencies are evolving into so-called soft skills. Multicultural communication, emotional intelligence, self-awareness are emerging. Critical and creative thinking is evident in both Industry 4.0 and 5.0.

4. The cybernetic human-machine-environment system in society 5.0

The development of science and technology induces the human being to strive for comfort regardless of whether the activity is performed professionally or not. Comfort has created the need to analyze the relationship that occurs between man, his actions in the work process and the environment. Each workstation can be represented symbolically in the form of two components, representing the human being on the one hand and the means of work on the other. Its two components are symbolic. Under the concept of man, there can be both an individual and a group of people. The same is true of the second component of the system. The means of labor can be: a tool one piece of equipment or the entire production line. The workstation itself can also be the second element of the system. There are certain processes constantly taking place between these two elements, resulting from their interaction. Both of these elements operate under specific conditions of the external environment. It has an effect on each of these elements (although different). Also, the elements of the system affect the environment, both near and far. Therefore, a more apt term is man-machine-environment system.

The term "system" is understood here as "system". It is ambiguous, referring to a set of rules of conduct or ways of organizing, arranging or subordinating the elements that make up the whole (Osvalder, Ulfvengren, 2017).

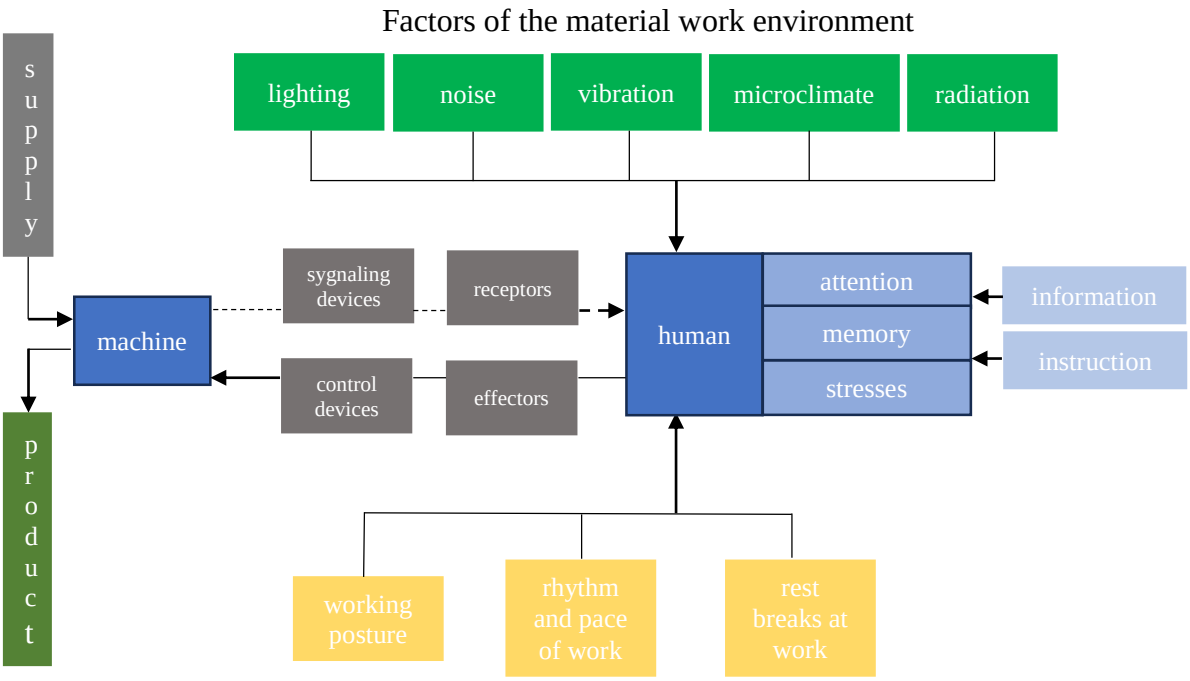

Figure 4. Diagram of man-machine-environment system.

Source: own elaboration based on a survey conducted at a manufacturing company.

The diagram presented above shows how much the human being is burdened in this system. The machine, on the other hand, is supplied with energy, raw materials, and information so that it produces a finished product through human control. Its task is also to signal shortages, defects. In addition to controlling the machine, man must also adapt to the prevailing workplace environment and anthropotechnical and organizational conditions.

Industry 5.0 will significantly increase production efficiency and create versatility between humans and machines, enabling accountability for interaction and continuous monitoring of operations. Industry 5.0 is an evolution of the future designed to harness the creativity of human experts working together with efficient, intelligent and accurate machines (Pizoń, 2022).

Industry 5.0 is a concept that is designed to harmonize the workspace and productivity of humans and machines in a cohesive way. Although Industry 5.0 is already in the implementation phase, global standards and policies are still evolving to make it an international standard (Maddikunta, 2022). This fifth industrial revolution is also more beneficial to society, the environment, the economy and the planet. The concept of Industry 5.0 aims to reverse the dehumanization of industry, taking into account the key role of humans in society and their needs, being closer to sustainable development (Saniuk, 2022).

Another important issue that needs to be addressed is the risks to the worker in the human-machine-society cybernetic system. One risk factor is the stress of human-machine interaction, and the idea of Industry 5.0 proposes solutions and management of psychosocial risks, with the goal of employee well-being in the workplace.

Risk management is becoming a key element in the success of Industry 5.0, as the integration of advanced technologies can bring new challenges in terms of cyber security and data privacy. Likewise, it can bring new risks to employee job security and the physical integrity of machines and equipment. To deal with these risks, risk management in Industry 5.0 must be approached in an integrated manner, including the adoption of risk mitigation and control measures such as remote monitoring and diagnostic systems, access control and user authentication, system redundancy and data backup, training for work and security teams, and the use of advanced failure detection and prevention technologies. Thus, it can be said that Industry 5.0 puts people at the center and restructures their tasks in the production domain to benefit employees and reduce risks (Longo, 2020).

5. Methodology and results

The issue of society 5.0 in the context of occupational health and safety was the subject of a survey at a small manufacturing company in Bydgoszcz. The company employs 42 people, including 34 production workers and 8 administrative employees. In the company, the largest group is made up of employees over 40 years of age, with seniority of more than 15 years and with secondary education. There are very few young and inexperienced employees, only 4 people. Probably the reason for this is the type of work. The sewing room mainly employs women with experience and skills. All of them took part in the survey. Unfortunately, the first filter question reduced the number of respondents to 25. It turned out that 17 employees had not heard of the concept of society 5.0, they do not know what it refers to. Also, their further participation in the survey was impossible. Summary sheet of survey results presents table 2.

Table 2.
Summary sheet of survey results

question from the survey questionnaire	response scale				
	definitely no	no	no opinion	yes	definitely yes
	1	2	3	4	5
1. Are you aware of the concept of society 5.0 and its impact on your company?*	10	7	0	23	2
* 17 employees at this stage completed participation in the study					
2. Does your company consciously manage health and safety at work?	0	0	0	2	23
3. Do you think attitudes toward health and safety are changing for better in the era of society 5.0?	2	3	5	7	8

Cont. table 2.

4. Have you received adequate training on health and safety in the context of society 5.0?	4	16	0	2	3
5. Do you know what technologies and solutions your company is using to improve workplace safety?	5	12	2	4	2
6. Do you feel that your opinions and comments on health and safety are taken into account by the company?	1	14	1	6	3
7. Do you know what the emergency procedures are and how to deal with safety hazards in the workplace?	0	0	0	18	7
8. Do you have access to appropriate personal protective equipment in the workplace?	2	4	2	12	5
9. Are you aware of the risks associated with working in the 5.0 era and what are the countermeasures to minimize them?	3	5	2	11	4
10. Do you think the company is taking sufficient measures to ensure occupational hygiene, especially in the context of new technologies?	2	2	1	15	5
11. Do you think that in the era of society 5.0, the "man-machine-environment" system plays a key role in your field of work?	0	1	0	17	7
12. Do you think that the material work environment factors present at your workplace do not negatively affect occupational hygiene?	3	7	3	7	5
13. Do organizational work environment factors improve your safety and well-being at work?	3	3	3	9	7
14. Have you received adequate training on safety and the use of technology in your work?	2	3	1	4	15
15. Do you think the work environment in the 5.0 era affects your efficiency?	0	0	0	8	17

Source: own study.

Managing occupational health and safety in a manufacturing company requires a strong commitment from the organization's leadership. Employees unanimously agreed that visions of a safe workplace are being consistently built at their company. In contrast, respondents are not entirely convinced that the era of society 5.0 can change anything for the better in the area of occupational health and safety. In addition, as many as 80% of respondents admitted that they do not have had yet the opportunity to participate in training on aspects of safe work in the era of building society 5.0. The same is true of knowledge of solutions and technologies to enhance safety at the workplace, 76% of respondents have no data in this regard. What's more, as many as 64% of respondents believe that their opinion and suggestions on increasing safety and improving occupational health are not taken into account by their superiors. On the other hand, a positive surprise is the fact that all employees participating in the survey are aware of the dangers present at their workplaces and know what action to take at the time of danger. Also, the vast majority emphasize that they have constant access to the necessary personal protective equipment.

The coming era of society 5.0 is not unknown to the employees of the surveyed company, as shown by their answers to the question of whether they are aware of the risks that this new stage of society entails. It turns out that the vast majority know what the risks of entering the era of society 5.0 may be. In addition, employees are very positive about the approach of the

organization's management to preparing the workplace in terms of ensuring the safety of staff in the face of the implementation of new technologies.

When asked about the roles of the human-machine-society system, employees answered almost unanimously that it is very important in their work. On the question of the influence of material factors of the work environment on task performance, the answers are very different. 48% of employees believe that these factors do not affect their work activity, which may mean that at their workplaces the presence of these factors is not perceptible or burdensome. In contrast, 40% take the opposite view and feel the annoyance caused by material factors. On the other hand, organizational work environment factors, for as many as 64%, are an important part of creating safe working conditions and improve their comfort at work. Also, a large group of employees, as many as 76% of the surveyed employees confirm that they have been well prepared to work with machines and operate them properly. All employees participating in the survey confirmed that they believe the work environment in the era of society 5.0 definitely serves to improve work efficiency. Figure 5 presents a graphical representation of the aggregate results of the survey.

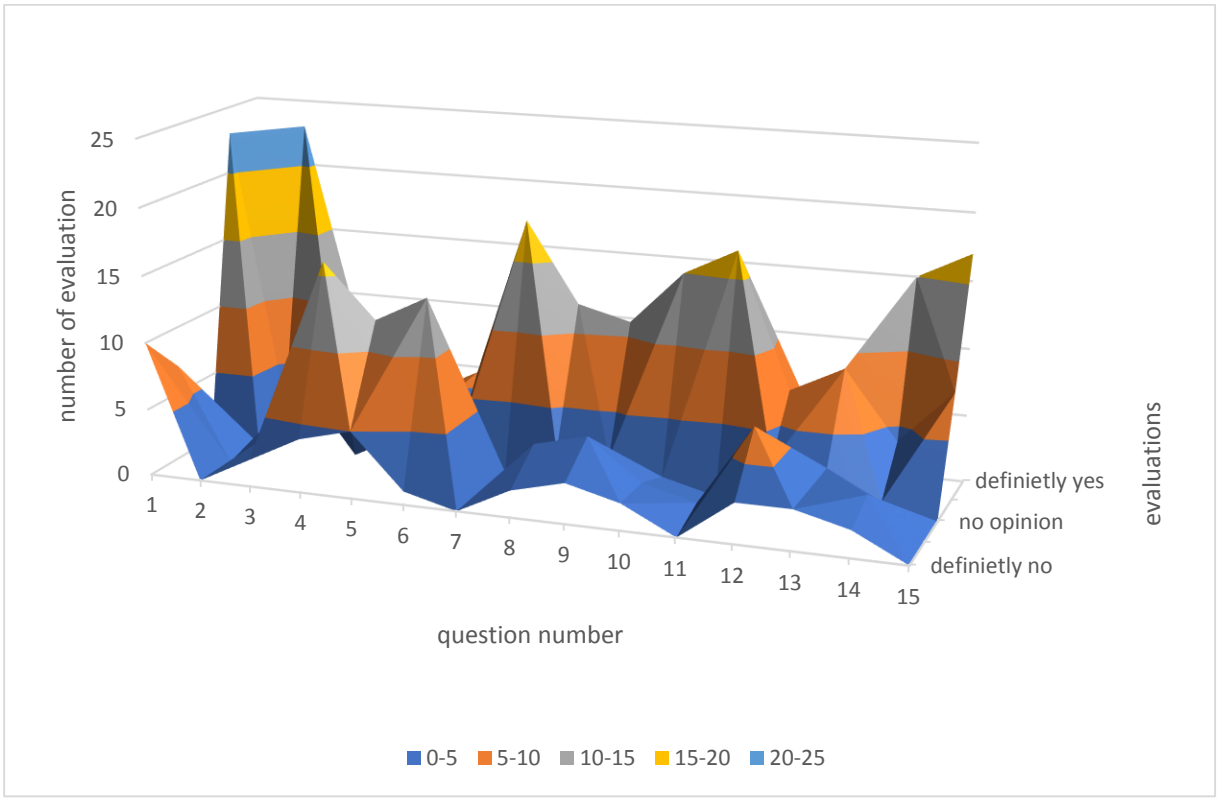

Figure 5. Graphical representation of the aggregate results of the survey.

Source: own study.

A survey conducted at the sewing plant shows that occupational health and safety is becoming an important area of the company's operations. The awareness of both employees and employers is increasing all the time. The new era of society 5.0 is also not something for most employees to fear. They approach this stage with the hope that it will bring changes for the better in the area of occupational health and safety.

In the company under study, the human-machine-environment system functions properly. Employees are aware of the complexity of their work and know that they play an important role in this system. The employer's attention to ensuring proper working conditions is positively perceived by employees. The microclimate is kept within the right parameters, so that employees do not experience fatigue associated with too high or low temperatures. Employees are provided with personal protective equipment, which allows them to effectively minimize noise. Break times are set so that workers can freely reach the dining room, rest and eat a meal. The working position is unfortunately enforced and difficult to change, so after each hour of performing work in a sitting position at the machine, each worker can get up for 5 minutes and during this time perform activities in a standing position.

6. Conclusions

As society 5.0 gains momentum, transforming work environment and human relationships, health and safety issues are becoming more complex and challenging than ever before. It is worth noting that this evolution is opening up new opportunities and challenges for workers, employers and occupational health and safety professionals.

The era of society 5.0 introduces new technologies such as artificial intelligence, the Internet of Things, robotics and automation, which have the potential to revolutionize many industries. But with these innovations also come new safety risks and needs. Employees must be properly trained to operate these technologies and understand the potential risks associated with them. Moreover, in the era of Society 5.0, a "man-machine" partnership approach is key, where people and technology work together, complementing each other. Employee safety is no longer just about avoiding machine-related accidents, but also about protecting against data and cyber security threats. It is important for employers to invest in proper training and procedures so that employees are aware of the risks and know how to deal with emergencies. At the same time, employees should be involved in the decision-making process related to security in their workplace, as they are often the best at identifying potential risks. It is important for employers in a 5.0 society to understand that investments in employee safety and health pay dividends not only in terms of reducing the risk of accidents, but also in terms of increasing the company's efficiency and competitiveness.

In summary, the era of Society 5.0 brings both new opportunities and new challenges for occupational health and safety. For workers, employers and health and safety professionals, there is a need to constantly adapt and evolve to ensure a safe and healthy workplace in this dynamic and innovative environment. But understanding these challenges and acting accordingly can help you succeed and be sustainable in a 5.0 society.

References

1. Andrew, O.C., Saudah, S. (2012). Individual factors and work outcomes of employee engagement. *The 2012 International Conference on Asia Pacific Business Innovation and Technology Management, Pattaya, Thailand, Vol. 40*. Procedia-Social and Behavioral Sciences, p. 501.
2. Avilla-Guitereez, M.J., Suares-Fernandes de Miranda, S., Aguayo-Gonzalez, F. (2020). Occupational Safety and Health 5.0—A Model for Multilevel Strategic Deployment Aligned with the Sustainable Development Goals of Agenda 2030. *Sustainability, Vol. 14*, p. 6.
3. Ghobakhloo, M., Iranmanesh, M., Mobashar, M., Rejeb, A., Nilashi, M. (2022). Identifying industry 5.0 contributionss to sustainable development: A strategy roadmap for delivering sustainability values. *Sustainable Production and Consumption, Vol. 33*, p. 721.
4. Goździewska-Nowicka, A. (2019). The impact of ergonomics on the functioning of older people in the work environment. *Zeszyty Naukowe Politechniki Poznańskiej. Organization and Management, 80,* pp. 17-19.
5. Hayashi, Y. (2019). Japanese Science and Technology Basic Plan: A perspective of policy process. *Innovation and Development Policy, Vol. 1*, p. 26.
6. Legg, S.J., Olsen, K.B., Laird, I.S., Hasle, P. (2015). Managing safety in small and medium enterprises. *Safety Science, Vol. 71*, p. 190.
7. Longo, F., Padovano, A., Umbrello, S. (2020). Engenharia de tecnologia ética e orientada para o valor na Indústria 5.0: uma perspectiva centrada no ser humano para o design da fábrica do futuro. *Ciências Aplicadas, 10*, p. 4182.
8. Maddikunta, P.K.R., Pham, Q., Prabadevi, B., Deepa, N., Dev, K. (2022). Industry 5.0: A survey on enabling technologies and potential applications. *Journal Industry, Infrastructure Integration, 26*, p. 1257.
9. Mohd, J., Abid, H. (2020). Critical Components of Industry 5.0 Towards a Successful Adoption in the Field of Manufacturing. *Journal of Industrial Integration and Management, Vol. 5*, p. 328.
10. Occupational safety and health in Europe: state and trends 2023. Luxembourg: Publications Office of the European Union (2023).
11. Osvalder, A.L., Ulfvengren, P. (2017). *Human-machine systems. Work and technology on human terms*, p. 352.
12. Pizoń, J., Gola, A. (2023). Human-Machine Relationship – perspective and future roadmap for industry 5.0 solutions. *Machines 11(2)*, p. 203.
13. Rączkowski, B. (2022). *BHP w praktyce*. Gdańsk: Wydawnictwo ODDK.
14. Ricciolli, L. (2023). Artificial Intelligence: innovation for society 5.0. *SSRN, 2*, p. 21.

15. Saniuk, S. (2022). Identification of Social and Economic Expectations: contextual Reasons for the Transformation Process of Industry 4.0 into the Industry 5.0 concept. *Sustainability 14*, p. 1391.
16. Shujiro, U. (2021). Japan's Asia-Pacific Economic Strategy: Toward the Revival of the Japanese Economy. *Asia-Pacyfic Review, Vol. 28*, p. 37.
17. Tepe, S. (2021). The impact on industry 4.0 on Occupational Health and Safety. *International Journal Advanced Engineering and Pure Science, Vol. 33*, p. 125.
18. Twaróg, J., Mieczkowski, P. (2019). *Krótka opowieść o społeczeństwie 5.0, czyli jak żyć i funkcjonować w dobie gospodarki 4.0 i sieci 5G*. Warszawa: Wydawnictwo Krajowej Izby Gospodarczej Elektroniki i Telekomunikacji, p. 28.
19. Weinstein, M.B. (1997). *Total Quality Safety Management and Auditing*. Boca Raton, Florida: CRC Press LLC.
20. Yogeswara, T., Siddiqui, N.A., Hamsagar, R.S., Muenster, R.N. (2013). A study of environment, health and ehs (ehs)-culture evaluation and developing improvement plan for industries through a technical study. *Journal of Industrial Pollution Control, 29(2),* p. 268.