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The role of visual management in the organization of safe work in production companies

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Abstract
Workers play a superior role in the production process because they are responsible for its proper functioning (e.g. process efficiency, quality, technical condition of usage machines), and are also responsible for safety at work. The issue of work safety should be a crucial factor in the process of introducing changes in the company. The introduced changes should take into account safe working conditions and reduce the number of potential accidents, therefore employers should implement solutions aimed at improving work safety. One of the tools that can affect work safety is visual management (VM). The use of various forms of VM enables immediate response to emerging problems, which may translate into an increase in employees' awareness of health and safety issues. The article presents the possibilities of using of visual management tools in manufacturing companies in terms of improving work safety. The proposed solutions can be used by enterprises that register accidents at work and take actions to increase employees' awareness of occupational safety and health (OSH).

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1. Introduction

Ensuring safe working conditions is a legal and social duty of employers. The responsible management of OSH area involves not only the prevention of accidents at work and occupational diseases and - it is also an integral part of the development of a company with an appropriate level of safety culture perceived as a factor influencing the attitudes and behavior of employees in terms of health and level of safety (Chojnicki and Jaroszewicz, 2019; Cooper, 2000). An important factor influencing safe attitudes and behavior in the work environment is also the high awareness of employees in terms of OSH - creating this awareness should be a priority for every company (Niciejewska et al., 2021).

Every year, a significant number of accidents at work are reported in industrial enterprises in Poland, as evidenced by the data from Statistics Poland. This is especially true for two occupational groups: industrial workers and craftsmen as well as operators and assemblers of machinery and equipment (Statistics Poland). A reduction of those events is possible through the adoption of solutions that mitigate the risk of the occurrence of accidents and cooperation between employers and employees in the area of OSH. One of such solutions is the use of visual management (VM), which is one of Lean Manufacturing tools. The popularity of visual management in the LM concept results from the possibility of using it in solving various types of problems (Klimecka-Tatar, 2018) – also in the field of OSH.

LM is a production system derived from the Toyota Production System, which is used by companies all over the world (Bouazza et al., 2021). The production in that system is defined as lean because it uses fewer resources compared to mass production in half the time (Womack et al., 1991). The main aim of LM system is to eliminate or reduce actions that do not add value in processes referred to as *muda* (Melton, 2005; Pavanscar et al., 2003). LM offers various methods and tools (Palange and Dhatrak, 2020; Leksic et al., 2020; Mazur and Momeni, 2018), which can bring many benefits for companies, such as eliminating shortages and errors, faster delivery times, increased productivity and improved safety (Nguyen and Duong, 2022). It is believed (Anvari et al., 2011) that work intensification resulting from LM actions may cause stress in employees and increase the risk of hazards (accidents). It is therefore important to create an appropriate Lean environment in the workplace, which requires motivation among the staff and good management so that the intended objectives are achieved. The key to employee safety in LM actions is the development of informed and active employees

who have the expertise, skills and ability to act in the workplace to eliminate or reduce risks (Anvari et al., 2011; Ulewicz and Lazar, 2019). Consequently, the use of VM by companies can translate into increased awareness of safety issues and be a tool supporting a reduction of accidents at work.

Research indicates that thanks through the use of visual management:

- the work environment is improved in terms of safety, thereby reducing the risk of accidents (Cordeiro et al., 2020),
- discipline, transparency and information sharing increase, thanks to which employees better understand processes and are more involved (Eaidgah et al., 2016),
- stress at work is reduced (Sá et al., 2021).

In addition, it is emphasized (Abdelkhalek et al., 2019) that VM should be implemented and used to manage employee behavior in order to increase work safety, and management should train employees in the VM solutions used.

The aim of the study is to assess the possibilities of using visual management as a form of communication in the field of occupational health and safety. Therefore, for the purpose of the study, a research thesis was adopted that it is possible to improve work safety through the use of various forms of visual management.

2. Literature review

Various terms are used in the literature to relate to the term visual management, namely: visual workplace, visual control, visual tools, visual communication. The coexistence of these concepts and their interconnection is common practice in manufacturing companies that implement this approach (Tezel et al., 2009).

In general, VM is a managerial strategy that lays emphasis on effective visual communication and is pursued by means of various visual tools (Fig. 1), e.g. signs, markers, labels, colour codes, control sheets, graphs, pictures (Bell and Davison, 2013; Jaca et al., 2014). The consistent implementation of those tools in the work environment creates a visual workplace in which many benefits can be seen (Tezel et al., 2016; Beynon-Davies and Lederman, 2017) - in a visual workplace, every employee knows "who, what, when, where, why and how" in a few minutes (Anvari et al., 2011). As a result, the reaction to a given irregularity is immediate. Visual management may be used in the aspect of all processes in a company, it facilitates those processes so that they are safer, more effective and translate into the elimination of *muda* (Knop, 2016). The use of VM tools consists in giving employees all the information in a simple, clear and understandable manner (Imai, 2006; Kurpjuweit et al., 2019), so that places become self-ordering, self-regulating and self-improving (Galsworth, 2007). It makes it possible to determine how the work should be performed by employees and whether the method of its performance differs from the applicable standard (Liker, 2005). The use of appropriately selected VM tools informs employees in the production hall about the actual state, gives a warning when a disturbance occurs and allows for an immediate reaction to occurring problems – thus allowing for improvement measures to be taken (Imai, 2006).

It should be highlighted that employees' ability to identify irregularities, make a rapid response and their awareness of the consequences of undesirable events have an impact not only on the efficient execution of the production process but also on the safety of performed work.

The diversity of visual management forms may occasionally lead to difficulty with the selection of a tool adequate for the situation. What matters is the results that the company intends to achieve using VM. Therefore, the management should manage its resources in such a way that any deviations from the standard are presented using VM and are understandable to receivers. As part of management in 5M, examples of the use of visual management tools can be indicated:

- employees (man) management: competence matrix, one-point lessons (OPL),
- materials management: kanban cards, light and sound signs to signal shortage of materials,
- machines management: poka-yoke, machine operating instruction, LOTO system, maintenance plan,
- methods management: safety standards, job standards.
- measurement management: marking of measuring devices.

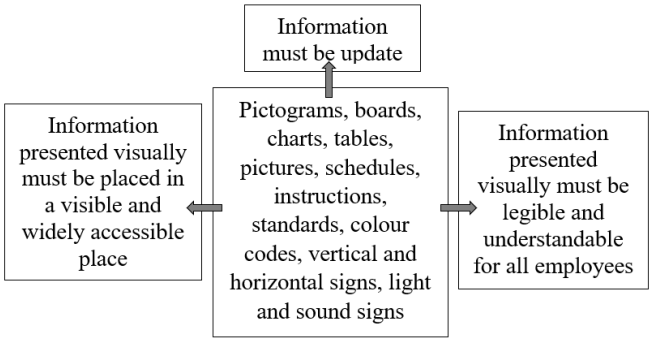

Fig. 1. Examples of tools of VM

In the literature (Tezel et al., 2009) nine visual management functions have been identified and defined, which allows for a broader look at the possibilities of using VM in production companies and decision-making by management (also in the field of OSH):

1. Transparency – means the ability of process to communicate with employees (the main process flows should be visible and understandable, using VM tools).
2. Discipline – understood as compliance with standards by employees (distinguishing between correct and incorrect states) and reacting to any irregularities. VM tools should affect the correct behavior of employees.
3. Continuous improvement – is defined as a process of sustainable incremental innovation in the enterprise, and the use of VM can become the basis of this process by involving employees in improvement projects.
4. Job facilitation – facilitating routine tasks by offering a variety of visual aids (if done correctly, visual communication can eliminate many mistakes during work).
5. On-the-job training – communicating information in the workplace through VM tools is an efficient way of

learning (this type of training helps employees learn through experience).

6. Creating shared ownership - can be defined as a feeling of being tied to a material or an immaterial object. In this sense, visual management, through various forms that are visible to all participants in the process, can help create of work culture.
7. Management-by-facts – using data to make decisions based on statistics. In this sense, VM helps management to convince employees that management practices in the enterprise are valid because they are based on data and facts.
8. Simplification – VM should enable efficient monitoring of the process, filtering various data and visualization of crucial information in the workplace. In this sense, VM is treated as a system that allows employees to check the current state of the process (at any time) and react to changes.
9. Unification – means creating a uniform working environment through effective exchange of information necessary to perform tasks. This is possible thanks to the use of VM tools that reflect the current state of the process in an unambiguous and understandable way for everyone.

The literature (Kurpjuweit et al., 2019) emphasizes that visual management not only focuses on the transfer of messages, but also facilitates the exchange of key, strategic information (e.g. translating into work safety). In addition, VM increases the involvement of employees in improvement activities. These factors are recognized as success factors in every improvement project, also in the field of improving work safety.

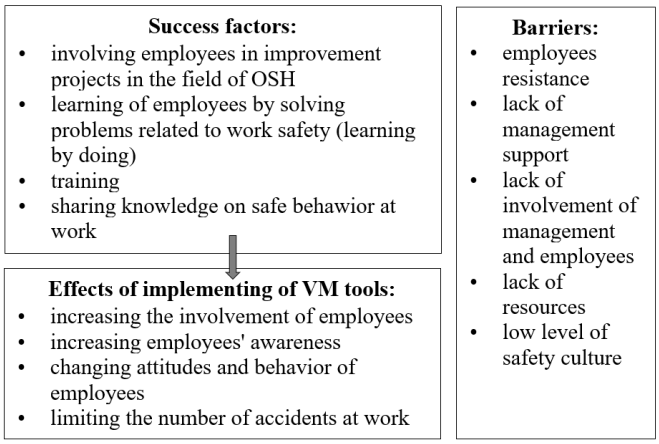

Fig. 2. Factors affecting the effects of implementing VM tools in terms of work safety

Implementing visual management as part of the improving initiative may translate into increased awareness of employees in the field of OSH and a reduction in the number of accidents at work. It is therefore important to indicate the factors facilitating the achievement of this goal and to identify the existing barriers in the company. This will allow management to determine a detailed action plan to improve occupational safety.

Figure 2 shows the factors that may affect the implementation of VM tools in the field of health and safety. The identified factors can become a tool to verify the possibility of implementing VM in the enterprise and to take action to eliminate problems.

3. Methodology

This article aims to present the possibilities of the use of various visual management forms in the aspect of the improvement of work safety in production companies. A three-step research methodology was adopted in order to achieve the intended aim of the study.

In the first step, on the basis of data from Statistics Poland, the causes of accidents at work in the years 2016-2020 were identified. The identification of the causes of accidents at work is the first step towards improving working conditions in companies. The causes of accidents indicated in this study lay in irregularities that contributed directly or indirectly to their occurrence.

In the second step, VM tools feasible for use by companies in the production hall, directly at workstations or during training, were selected for the most common causes of accidents. The proposed visual management solutions can be an effective tool supporting the reduction of accidents at work and may increase employee awareness in that regard.

The third step consisted in an assessment of the impact of the proposed VM solutions on employee awareness, which has a significant effect on their behaviour in the area of OSH. The impact assessment was made on a three-level scale, where the highest impact was marked as "+++", medium impact "++", minor impact "+" (the assessment is a subjective interpretation of the impact of a VM tool on an increase in awareness among the staff).

4. Results and discussion

An analysis of the data from Statistics Poland showed that more than a half of accidents at work (60.6%) were caused by incorrect employee's action (Fig. 3). Those accidents were mainly due to: lack of concentration on the task at hand, surprise by an unexpected event, ignorance of the hazard, disregard for the hazard, improper pace of work, lack of experience.

An improper condition of the material agent accounted for 8.4% of the causes of all accidents at work – this group of causes was due to construction defects or inadequate technical and ergonomic solutions of the agent (e.g. no/ inadequate control devices, safety devices, inadequate signalling of hazards).

Another important cause of accidents at work was the improper general organization of work and workplace organization, which accounted in total for 9.7% of causes of all events. That group of causes was due, among other things, to: improper division of work, performing work that is not part of the job description, lack of supervision, toleration of deviations from health and safety regulations by superiors, lack of instructions, performing work without being trained, improper arrangement of equipment and materials at the workstation, lack of possibility of moving in the workstation, unnecessary objects at the workstation.

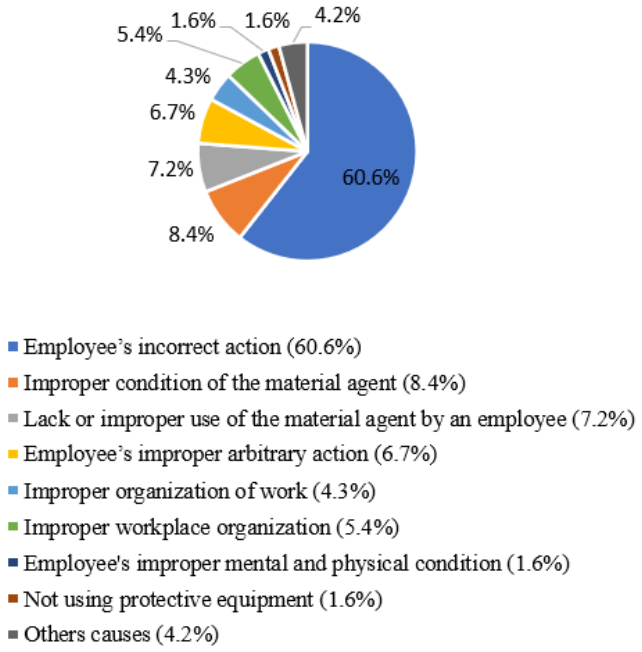

Fig. 3. Causes of accidents at work in Poland in 2016-2020

Another group of causes of accidental events was a lack or improper use of a material agent by an employee (7.2%). It was connected, among other things, with a misuse of the agent, improper holding, installing, attaching and securing the agent, performing work manually instead of using a material agent.

Improper arbitrary employee's action (6.7% of the causes of accidents at work) was due, among other things, to performing work without the removal of hazard or work that is not part of the job description, staying in unauthorized and dangerous areas.

A failure to use protective equipment and an employee's improper psycho-physical state were the least frequent causes of accidents at work (in total 3.2%). This study focuses on the most frequent categories of causes in the period under analysis. Some visual management solutions were proposed for those causes with the aim of reducing the possibility of their occurrence and making an impact on employee awareness and safe behaviour.

The use of one-point lessons is proposed for the causes of accidents connected with incorrect employee's action. OPL is a visual training tool that complements the expertise of employees in a short period of time and provides them with the information necessary to perform their work safely and correctly, reminding them of hazards existing in their workplace. OPL presents the necessary measures to be adopted to prevent accidents, which contributes to an increase in OSH awareness. Another proposal intended to reduce the occurrence of that group of causes is to use visual job instructions or work standards developed according to the objectives of the program Training Within Industry (TWI) – Job Instruction (JI), Job Safety (JS) (Graupp and Wrona, 2015). The JI module is an effective way of instructing employees on how they should do their job to eliminate errors, increase efficiency and improve safety. The JS module involves employees in identifying potential hazards and reduces such hazards in combination with training and knowledge of OSH provisions (employees learn safe behaviour in that way). A command of work standards, job instructions and their strictest observance have a huge impact on an increase in OSH awareness. It is also very important to mark visually traffic routes, danger areas (lines, tapes, sound signals, pictograms), which clearly inform employees of hazards, prohibitions and orders in force. It is proposed that action boards are used to visualize the course and results of actions aimed at improving safety – as an auxiliary tool during the training. It is also recommended that the same measures are adopted for the causes connected with improper arbitrary employee's action. The use of the proposed VM tools in both cases may reduce the possibility of the occurrence of accidents at work.

To reduce the causes of accidents related to the improper condition of the material agent and a lack or misuse of that agent, the following visual management solutions are proposed:

- marking the control devices,
- use of light or sound signals to warn of a hazard,
- Lockout-Tagout (LOTO) system to prevent hazards during the performance of service, adjustment, maintenance work,
- development of visual procedures for employees as part of the LOTO system,
- use of OPL to draw attention to the need to control the machines and safety devices,
- instruction of employees in accordance with TWI-JS,
- clear display of visual job instructions, work standards at the workplace.

The proposed solutions have a big impact on reducing accidental events and the provision of training (using OPL, TWI) may contribute to increased employee awareness in the area of OSH.

The application and adherence to the principles of the 5S/6S method is primarily recommended for a reduction in accidents related to the organization of work and workstation. By cleaning up the workplace, this method shows irregularities that pose a hazard (the key factor is self-discipline in employees and their superiors, which has a huge impact on an increase in awareness and the development of safe behaviour). Further recommendations include:

- development of visual job instructions in accordance with the principles of TWI-JI, TWI-JS,
- conducting short training courses using OPL,
- placement of pictograms at the workstation with information about hazards,
- designation and marking of hazardous areas, traffic routes, material storage areas and tool storage areas (as part of 5S/6S).

Table 1 (in the Appendix) shows the various VM tools in terms of the most common causes of accidents at work analysed in the study. The proposed solutions can improve work safety in various areas of the company: in the shop floor, at the workplace and during training. The use of these solutions may translate into a change in the behavior of employees in terms of OSH and a reduction in the number of accidents at

work. An evaluation of the extent of the impact of a given solution on an increase in employee awareness in the area of OSH was made using the adopted methodology.

5. Summary and conclusion

The conducted analysis of the causes of accidents at work in production companies allowed to compile VM tools that may translate into reducing the occurrence of accidents at work and increasing the awareness of employees in the field of OSH. The VM tools presented in Table 1 can be a tool supporting the improvement of work safety for enterprises. On the basis of the adopted methodology, the impact of these tools on employees' awareness of work safety was assessed. It was found that all the proposed VM tools have an impact on employee awareness, but the following have a significant impact: one-point lessons, instruction using the TWI program, LOTO system, action boards – because of the direct contact with employees, drawing attention to significant problems connected with OSH and involvement of all employees in joint actions relating to safety.

The proposed solutions in the field of visual management can be used in production companies of different sectors. Limitations related to the use of specific VM tools may result from the production company's business profile, available resources, involvement of employees and management.

The scope of the conducted research was limited to the possibility of using visual management in terms of improving work safety, however, the variety of VM forms allows solving problems also related to the organization of work and production.

In order to obtain results on the effectiveness of VM in reducing the number of accidents at work, quantitative research should be carried out - which is the direction of further research by the authors.

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Reference

Abdelkhalek, E.S., Elsibai, M.D., Ghosson, G.K., Hamzeh, F.R., 2019. Analysis of Visual Management Practices for Construction Safety. 27th Annual Conference of the International. Group for Lean Construction (IGLC), Dublin, Ireland, 1069-1080, DOI: 10.24928/2019/0175.

Anvari, A., Zulkifli, N., Yusuff, R.M., 2011. Evaluation of approaches to safety in lean manufacturing and safety management systems and clarification of the relationship between them. World Applied Sciences Journal, 15 (1), 19-26.

Bell, E., Davison, J., 2013. Visual Management Studies: Empirical and Theoretical Approaches. International Journal of Operations and Production Management, 15 (2), 167-184, DOI: 10.1111/j.1468-2370.2012.00342.x.

Beynon-Davies, P., Lederman, R., 2017. Making sense of visual management through affordance theory. Production Planning & Control, 28 (2), 142-157, DOI: 10.1080/09537287.2016.1243267.

Bouazza, Y., Lajjam, A., Dkhissi, B., 2021. The Impact of Lean Manufacturing on Environmental Performance in Moroccan Automotive Industry. Management System in Production Engineering, 3 (29), 184-192, DOI: 10.2478/mspe-2021-0023.

Chojnicki, J., Jaroszewicz, G., 2019. ABC BHP. Informator dla pracodawców, Państwowa Inspekcja Pracy, Warszawa.

Cooper, M.D., 2000, Towards a model of safety culture. Safety Science, 36 (2), 111-136, DOI: 10.1016/S0925-7535(00)00035-7.

Cordeiro, P., Sá, J.C., Pata, A., Gonçalves, M., Santos, G., Silva, F.J.G., 2020. The Impact of Lean Tools on Safety - Case Study. Occupational and Environmental Safety and Health II. Studies in Systems, Decision and Control, 277, DOI: 10.1007/978-3-030-41486-3_17.

Eaidgah, Y., Maki, A.A., Kurczewski, K., Abdekhodaee, A., 2016. Visual management, performance management and continuous improvement: A lean manufacturing approach. International Journal of Lean Six Sigma, 7 (2), 187-210. DOI: 10.1108/IJLSS-09-2014-0028.

Galsworth, G.D., 2007. Visual Systems: Harnessing the Power of Visual Workplace, AMACOM, New York.

Graupp, P., Wrona, R.J., 2015. The TWI Workbook: Essential Skills for Supervisors, Productivity Press, New York.

Imai, M., 1997. Gemba Kaizen: A Commonsense, Low-Cost Approach to Management, McGraw-Hill, London.

Jaca, C., Viles, E., Jurburg, D., Tanco, M., 2014. Do Companies with Greater Deployment of Participation Systems use Visual Management More Extensively? An Exploratory Study. International Journal of Production Research, 52 (6), 1755-1770, DOI: 10.1080/00207543.2013.848482.

Klimecka-Tatar, D., 2018. Context of production engineering in management model of Value Stream Flow according to manufacturing industry. Production Engineering Archives, 21, 32-35, DOI: 10.30657/pea. 2018.21.07.

Knop, K., 2016. Zarządzanie wizualne jako istotny element w doskonaleniu firmy produkcyjnej. Zeszyty Naukowe Politechniki Śląskiej. Seria: Organizacja i Zarządzanie, 87 (1947), 237-251.

Kurpjuweit, S., Reinerth, D., Schmidt, Ch.G., Wagner, S.M., 2019. Implementing visual management for continuous improvement: barriers, success factors and best practices. International Journal of Production Research, 17 (57), 5574-5588, DOI: 10.1080/00207543.2018.1553315.

Leksic, I., Stefanic, N.,Veza, I., 2020. The impact of using different lean manufacturing tools on waste reduction. Advances in Production Engineering & Management, 1 (15), 81-92, DOI: 10.14743/apem2020.1.351.

Liker, J.K., 2015. Droga Toyoty. 14 zasad zarządzania wiodącej firmy produkcyjnej świata, MT Biznes, Warszawa.

Mazur, M., Momeni, H., 2018. LEAN production issues in the organization of the company – the first stage. Production Engineering Archives, 21, 36-39, DOI: 10.30657/pea.2018.21.08.

Melton, T., 2005. The benefits of Lean Manufacturing: What Lean Thinking has to offer the process industries. Chemical Engineering Research and Design, 83 (6), 665-666, DOI: 10.1205/cherd.04351.

Nguyen, D.M., Duong, T.K., 2022. Enterprises Characteristics and Lean Outcome: An Empirical evidence from Vietnam Manufacturing Enterprises. Management System in Production Engineering, 2 (30), 98-108, DOI: 10.2478/mspe-2022-0013.

Niciejewska, M., Idzikowski, A., Lestyánszka-Škurková, K., 2021. Impact of Technical, Organizational and Human Factors on Accident Rate of Small-Sized Enterprises. Management System in Production Engineering, 2 (29), 139-144, DOI: 10.2478/mspe-2021-0018.

Palange, A., Dhatrak, P., 2021. Lean manufacturing a vital tool to enhance productivity in manufacturing. Materials Today: Proceedings, 46 (1), 729-736, DOI: 10.1016/j.matpr.2020.12.193.

Pavanscar, S.J., Gershenson, J.K., Jambekar, A.B., 2003. Classification scheme for lean manufacturing tools. 13 (41), 3075-3090, DOI: 10.1080/0020754021000049817.

Sá, J.C., Manuel, V., Silva, F.J.G., Santos, G., Ferreira, L.P., Pereira, T., Carvalho, M., 2021. Lean Safety - assessment of the impact of 5S and Visual Management on safety. IOP Conference Series: Materials Science and Engineering, 1193 012049, DOI: 10.1088/1757-899X/1193/1/012049.

Statistic Poland, Accidents at work, http://stat.gov.pl/obszary-tematyczne/rynek-pracy/warunki-pracy-wypadki-przy-pracy/

Tezel, A., Koskela, L., Tzortzopoulos, P., 2009. The Functions of Visual Management. International Research Symposium, Salford, UK, https://eprints.hud.ac.uk/id/eprint/29091.

Tezel, A., Koskela, L., Tzortzopoulos, P., 2016. Visual management in production management: a literature synthesis. Journal of Manufacturing Technology Management, 27 (6), 766-798, DOI: 10.1108/JMTM-08-2015-0071.

Ulewicz, R., Lazar, L.V., 2019. The Effect of Lean Tools on the Safety Level in Manufacturing Organisations. System Safety: Human – Technical Facility – Environment, 1 (1), 514-521, DOI: 10.2478/czoto-2019-0066.
Womack, J.P., Jones, D.T., Roos, D., 1991. The Machine that Changed the World, HarperPerennial, New York.

Appendix

Table 1. Proposition of VM solutions and assessment of their impact on employees' awareness of work safety

Causes of accidents at work	VM tools on the shop floor	VM tools at the workplace	VM tools in the area of training
Employee's incorrect action and employee's improper arbitrary action	Warning signs (++) Prohibition and mandatory signs (++) Marking of traffic routes and dangerous areas (lines, tapes, sound and light signals) (++)	Pictograms on the machines (++) Visual job instructions/work standards in accordance with TWI-JI, TWI-JS (++)	OPL (+++) Action boards (+++) Instructing employees according to TWI-JS, TWI-JI (+++)
Improper condition of the material agent and lack or improper use of the material agent by an employee	Light or sound signalling in a dangerous situation (++) Safety instructions in visible places in the production hall (++)	Marking of control elements, measuring devices (++) LOTO system (+++) Visual job instructions/work standards in accordance with TWI-JI, TWI-JS (++)	Employee training under the LOTO system (+++) OPL (+++) Instructing employees according to TWI-JS, TWI-JI (+++)
Improper organization of work and workplace organization	Marking of traffic routes and dangerous areas (++) Marking of storage areas for components under the 5S/6S method (++)	Pictograms on the machines (++) Marking of storage places for work tools under the 5S/6S method (++) Visual job instructions/work standards in accordance with TWI-JI, TWI-JS (++) Red Tags to identify and eliminate threats (under the 5S/6S method) (++)	Action boards (+++) OPL (+++) Instructing employees according to TWI-JS, TWI-JI (+++)

视觉管理在生产企业安全工作组织中的作用

關鍵詞
可视化管理
精益制造
工作安全
工伤事故

摘要
工人在生产过程中发挥着至关重要的作用，因为他们负责其正确运作（如流程效率、质量、使用机器的技术状况），同时还负责工作安全。工作安全问题应是引入公司变革过程中的关键因素。引入的变革应考虑到安全的工作条件并减少潜在事故的数量，因此雇主应实施旨在改善工作安全的解决方案。视觉管理（VM）是可以影响工作安全的工具之一。使用各种形式的 VM 可以立即响应出现的问题，这可能会提高员工对健康和安全问题的认识。本文介绍了在制造企业中使用视觉管理工具来改善工作安全的可能性。所提出的解决方案可以被在工作事故中进行登记并采取行动以提高职业安全和健康（OSH）意识的企业使用。