Managers' attitudes as a critical success factor of kaizen

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Abstract: *The purpose of our study is to examine the manager's attitudes towards different aspects of kaizen, their commitment to the idea of kaizen, and their attitudes towards the motivation and participation of employees. We use a questionnaire to investigate the attitudes of 124 managers – 62 economists and 62 engineers, from 62 manufacturing companies operating in Serbia. We employ exploratory factor analysis (EFA) and Mann-Whitney's U test. We find a moderate level of managers' agreement with the statements on the importance and effects of kaizen, and a relatively low level of agreement with the statements on employees' participation and motivation. Using the EFA, managers' attitudes are grouped into three areas requiring attention – perceived kaizen effects, employees' development and motivation, and employees' participation. Finally, we find that economists and engineers do not differ in their attitudes towards kaizen, which indicates their similar and common attitudes towards certain aspects of kaizen. We contribute to the literature by examining managers' attitudes towards the critical success factors of kaizen implementation and identifying the areas requiring more attention from the managers to support the social aspects of kaizen implementation and effects. Our results should change the perceptions of managers and contribute to the development of a new approach that involves more active and effective managers' participation in the kaizen implementation. Our results can also be beneficial to practitioners seeking to implement and use kaizen more efficiently in their companies. Although our study does not consider the direct impact of a specific economic environment on kaizen implementation, it can be beneficial to companies in emerging and transitioning economies similar to Serbian.*

Keywords: *Kaizen, perceived kaizen effects, manager's attitudes, manager's commitment, critical success factors.*

JEL Classification: *M11, M12, M54.*

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Introduction

Although kaizen has been researched in numerous studies and applied in business practice for several decades, its popularity is not diminishing. Researchers still study the process and effects of kaizen implementation and generally agree that successfully implemented kaizen leads to the achievement of business excellence (Lina & Ullah, 2019; Mohammad & Oduoza, 2020). Many companies around the world still largely rely on the use of this philosophy and a continuous improvement tool to reduce waste and increase business performance (Alvarado-Ramirez et al., 2018; Verbickas, 2021).

The effects of kaizen implementation are, nevertheless, often below expectations, which opens the question of the critical success factors (CSFs) that affect it. The significance and impact of these CSFs differ among companies and economies, but they all need to be identified and managed (Garcia et al., 2013; Glover et al., 2011; Hailu et al., 2017; Rivera-Mojica & Rivera-Mojica, 2014).

Some authors argue that the national context and the specific business culture significantly determine the success of kaizen and other continuous improvement programs (CIPs) implementation (Janjic et al., 2020; Todorovic & Cupic, 2017). Some argue that the most important CSFs of kaizen implementation are related to human factors (Buren, 2021; Garza-Reyes et al., 2022; Kharub et al., 2023; Lina & Ullah, 2019; Oropesa-Vento et al., 2016). The participation and contribution of employees and managers are considered essential in making small and gradual changes involved in kaizen implementation. Lina and Ullah (2019) point out that the success of kaizen comes from people and their actions, not from new pieces of equipment and machinery. Garcia et al. (2014) suggest that the main CSF of kaizen is managerial commitment and motivation, the second most important is support from senior management and resource allocation, while the third most important is leadership. Oropesa-Vento et al. (2016) show that factors such as the development of management skills and knowledge, adopting more positive attitudes, professional development of employees, communication with employees, and employee motivation are important for kaizen success.

Managers' attitudes towards kaizen reflect their perceptions of the idea of kaizen and indirectly indicate the level of their knowledge and commitment, which in turn affects the level of their motivation to implement it. We propose that the managers' attitudes towards kaizen are their main drivers and motivators. They determine their behaviour, the decisions they make, and consequently, the success of kaizen. Given the importance of managers for kaizen success, we aim to examine the manager's attitudes towards different aspects of kaizen, their commitment to the idea of kaizen, and their attitude towards motivation and participation of employees. More specifically, we aim to answer the following research questions:

RQ1: What are managers' attitudes towards the implementation and effects of kaizen?

RQ2: How do managers perceive employees' motivation and participation in the context of kaizen?

Although we conduct the research in a specific environment of the emerging and transitioning Serbian economy, our study does not consider the direct impact of the economic environment on kaizen implementation but can be beneficial to companies in similar economies. By addressing our research questions, we address several research gaps and thus make several contributions to the extant literature.

Although previous studies often identify employees' and managers' attitudes as CSFs of kaizen, they rarely investigate these attitudes. We find only a few studies examining managers' or employees' attitudes towards kaizen or CSFs of kaizen (Garza-Reyes et al., 2022; Janjic et al., 2020; Liu et al., 2015; Oropesa-Vento et al., 2016). The first contribution of our study is, therefore, a comprehensive analysis of managers' attitudes towards the CSFs of kaizen implementation. Few studies examine the social aspects of building sustainable kaizen within a company or achieving sustainable kaizen effects. For example, Ahuja et al. (2019) argue that there is no study available that covers the modelling of people related critical success factors of SM (sustainable manufacturing) practices, while Glover et al. (2011) argue that a majority of the current literature focuses on the sustainability of kaizen event technical system outcomes, with fewer studies considering social system outcomes. The second contribution of our study is, therefore, the identification of the areas requiring more attention from the managers to support social aspects of kaizen implementation and long-term effects. Although previous studies often conclude that managers can largely impact employee participation, the evidence on management approaches to and attitudes towards employee participation is scarce (Jurburg et al., 2019; Tafvelin et al., 2019). Our third contribution is, therefore, an empirical investigation of the managers' attitudes towards employee participation, employees' education and training, and identification of the problematic areas in this respect. Finally, our study also complements scarce literature on the specific individual-level factors and their interaction with organisation-level factors in driving kaizen activities (Nguyen et al., 2023), as well as the literature on the influence

of motivation and attitudes on work performance (Deressa & Zeru, 2019).

In addition to the introduction and conclusion, the paper consists of four parts. The first part of the paper provides a review of the previous research and presents our hypotheses. The second part presents the research methodology. The third part presents the results, while the fourth part presents a discussion of the results.

1. Theoretical background

Word kaizen is Japanese and means continuous improvement, principles of continuous improvement, or change for the better (Ahlstrom et al., 2021; Carnerud et al., 2018; Imai, 1986; Singh & Singh, 2015; Suarez-Barraza et al., 2011). Kaizen involves all managers and employees in a company and can be understood as a corporate capability that forms a part of improvement and innovation activities (Marin-Garcia et al., 2018). It is a management philosophy generating incremental improvements in the working method, that makes it possible to reduce waste and improve performance (Garza-Reyes et al., 2022), and increase productivity and produce high-quality products with minimum efforts (Carnerud et al., 2018; Garza-Reyes et al., 2022; Singh & Singh, 2015). It relies on the creative ideas of employees and produces results that are often barely noticeable in the short term.

Carnerud et al. (2018) find that the concept of kaizen is often used as a synonym for continuous improvement (CI), (although) essential disagreements exist in academia and practice concerning the definition and (in)compatibility of the two terms. Similarly, Suarez-Barraza et al. (2011) identify two variants of kaizen – Japanese and Western, understood as CI. They further explain that the Western variant of kaizen tends to be understood from a more practical managerial and organisational angle as a methodology and/or technique, as well as factor in other management approaches such as total quality management (TQM), lean manufacturing or the Toyota Production System (TPS).

Ahlstrom et al. (2021) argue that lean companies can improve soft skills practices, engagement of employees and social outcomes by studying the determinants of successful kaizen implementation. They also point out that kaizen can be understood as a possible definition or perspective of lean. Chiarini et al. (2018) argue that lean-TPS is often confused with kaizen, although kaizen is more related to TQM. They further explain that kaizen can be seen as a philosophy embracing TQM and lean-TPS. Singh and Singh (2015), on the other hand, point out that kaizen and TQM are interdependent but different – kaizen involves gradual, while TQM involves radical improvements.

Suarez-Barraza et al. (2011) and Carnerud et al. (2018) find that research on kaizen is scarce and that research on CI usually includes references to kaizen. They also find that kaizen studies often have a weak or no theoretical base and do not include a clear definition of kaizen and an explanation of the relationship between kaizen and CI. Carnerud et al. (2018), accordingly, argue that clarifying the theoretical foundations of both kaizen and CI is necessary to ensure successful implementation, while Suarez-Barraza et al. (2011) point out that there is a need to develop the theory of kaizen.

Kaizen needs to be understood and defined as more than just a set of tools, techniques and methods or an event – kaizen is also a philosophy, mindset, company-wide process, and vehicle to achieve strategic imperatives and execute improvement plans (Ahlstrom et al., 2021; Carnerud et al., 2018; Suarez-Barraza et al., 2011).

Kaizen implementation has potential. However, positive effects are not guaranteed. Their realisation depends on a large number of CSFs. In the present paper, we focus on the manager's attitudes towards different aspects of kaizen as a CSF of kaizen implementation.

1.1 Managers' commitment and support to kaizen

Jurburg et al. (2017) and Marin-Garcia et al. (2018) argue that kaizen implementation is not always straightforward and successful and that kaizen can be hard to sustain in the long term. Previous research shows that the knowledge and continuous training, i.e., continuous professional development of managers and employees, are CSFs of kaizen implementation (Garcia et al., 2014; Janjic et al., 2020; Lina & Ullah, 2019; Oropesa-Vento et al., 2016; Rivera-Mojica & Rivera-Mojica, 2014). Rivera-Mojica and Rivera-Mojica (2014), for example, find that the CSFs of kaizen implementation are the management commitment, focus on customers, training, communication process, integration of human resources, organisational culture, documentation, and evaluation.

The role of managers in kaizen implementation is the subject of numerous studies, mostly dealing with issues of managers' training and knowledge of kaizen. Bwemelo (2014) shows that the most important CSFs of kaizen implementation are well-trained managers and managers who motivate employees. Managers are expected to be dedicated, i.e., possess adequate knowledge and skills, be trained, and understand kaizen's ideas. In practice, however, it is not rare for managers to not understand the ideas of kaizens. They often expect instant results, while in reality, it takes time before the benefits of continuous improvements become visible (Todorovic et al., 2022). Alvarado-Ramirez et al. (2018) point out that a new managerial behaviour is the basis of continuous improvement, where the training and development of the human resource increases the commitment to achieve organisational changes.

Some researchers find that the managers' commitment and support are CSFs of kaizen (Aoki, 2008; Garcia et al., 2014; Glover et al., 2011; Janjic et al., 2020; Oropesa-Vento et al., 2016; Rivera-Mojica & Rivera-Mojica, 2014). Manager's commitment positively impacts the level of commitment of all employees (Suarez-Barraza et al., 2011), the profits and competitiveness of the company (Oropesa-Vento et al., 2016), and should lead to sustainable kaizen effects. Managers should demonstrate their dedication to kaizen, i.e., strong will, commitment, and persistence (Lina & Ullah, 2019). Suarez-Barraza et al. (2011) find that the lack of managers' support is the reason for abandoning kaizen implementation projects in 50% of cases. Management commitment and leadership capabilities are also often considered as CSFs of CI (Paipa-Galeano et al., 2020), lean (Argiyantari et al., 2022; Todorovic et al., 2022), and TQM (Aletaiby et al., 2021).

In the present study, we focus on the commitment and support of managers to kaizen. Specifically, we aim to analyse managers' attitudes towards the idea, importance, and effects of kaizen. Given the theoretical background and the results of previous studies, our first hypothesis is as follows:

H1: Managers' attitudes towards the implementation and effects of kaizen are positive.

1.2 Relationship of managers with employees

Managers are expected to motivate and positively affect employees. A key prerequisite for employee satisfaction is the attitude of managers or leaders both toward the achievement of goals and toward their subordinate employees (Stacho et al., 2023). The professional development and training of employees must be appropriately planned in the process of kaizen implementation. Managers are expected to train employees in different techniques and problem-solving skills in order to maintain and expand kaizen and similar concepts at all levels of a company (Marksberry et al., 2010). Oropesa-Vento et al. (2016) argue that training provides employees with the knowledge needed to be actively involved in CIPs, increases trust in the organisation, and supports processes of change. Aoki (2008) finds that the actions of managers are observed by employees and that these actions can give them the legitimacy to engage in kaizen activities. He adds that managers must show a lot of self-discipline if they want the workers to show the same self-discipline. Beraldin et al. (2019) similarly find that the adoption of soft lean practices increases employee engagement, while Argiyantari et al. (2022) find that employee skills development, along with leadership capability, helps reduce the resistance to lean implementation.

The fact that effective leadership is essential for encouraging employees to achieve goals is often overlooked. Hailu et al. (2017) show that one of the most important CSFs of kaizen implementation is effective leadership. Kaizen can be successfully implemented in different socio-economic contexts, but only with adequate company leadership (Lina & Ullah, 2019), dealing with the implementation of changes to face new challenges (Oropesa-Vento et al., 2016). Managers are expected to take on the role of facilitators to help employees achieve their goals (Buren, 2021). They are the major motivators during the kaizen implementation process.

One of the organisational culture conditions for the success of kaizen is adequate, efficient, and free information flow across the company. Janjic et al. (2020) stress the importance of an adequate system of internal communication and communication of strategic and operational goals. Karacsony et al. (2023) examined employees' attitudes towards organisational change and concluded that managers are expected to play an important role in the context of information and communication. Management should understand the importance of information sharing and build

an adequate communication system. Management is also responsible for creating adequate interpersonal relationships and a positive climate in the organisation. Lina and Ullah (2019) find that a good management-employee relationship where trust and empowerment are ingrained in the management practice, including management's willingness to communicate with employees and train them is one of the CSFs of kaizen implementation. Managers may encourage employees to perform better by boosting their sense of authority, support and commitment (Bakotic & Rogosic, 2017), while the hostile attitude of managers may result in emotional stress (Wu & Wu, 2019).

Greater trust between managers and employees increases the level of commitment to kaizen. The level of commitment also increases when employees are seen as part of the organisation (Suarez-Barraza et al., 2011). Buren (2021) argues that kaizen has been revolutionary in the way employees on the lowest level are treated. Kaizen fundamentally changes the position of the employees, placing them at the centre of attention. Buren (2021) further states that kaizen is built on cooperation between managers and employees and that employees should feel safe to share ideas and take responsibility. Macpherson et al. (2015) argue that kaizen results in an energy that permeates the organisation and creates a shared state of mind among employees to achieve proactive change and innovation. If changes are managed well, employees can have a positive attitude toward them (Karacsony et al., 2023).

Alvarado-Ramirez et al. (2018) argue that the participation of employees is essential for the correct application of CIP and that the presence of managers is key in order to achieve improvement in workers' skills, in addition to notable motivation, participation, and training, among other factors. Carnerud et al. (2018) similarly find that the concept of participation is a key issue for a definition of kaizen. Janjic et al. (2020) note, however, that often managers do not properly understand the importance of employees' ideas and initiatives, and argue that the education of managers and employees is probably the best solution to this problem. Given the theoretical background and the results of previous studies, our second hypothesis is as follows:

H2: Managers have a positive attitude towards employees' motivation and participation in the context of kaizen.

2. Research methodology

The main steps and activities of the research methodology used in this study are summarised in Fig. 1.

2.1 Questionnaire design

Given the theoretical background and the results of the previous studies on managers'

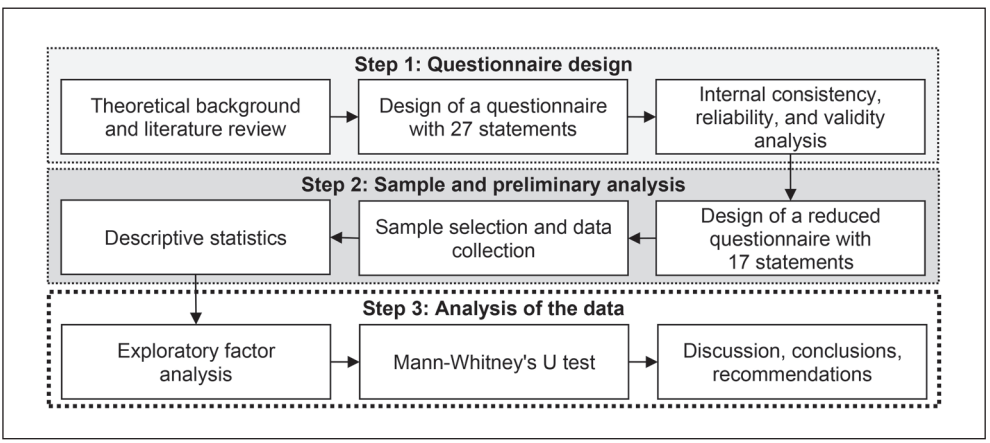

Fig. 1: Research methodology

Source: own

commitment and support to kaizen (Garcia et al., 2014; Glover et al., 2011; Janjic et al., 2020; Oropesa-Vento et al., 2016) and the relationship of managers with employees (Buren, 2021; Lina & Ullah, 2019; Marksberry et al., 2010; Suarez-Barraza et al., 2011), we first design a questionnaire with 27 statements to measure managers' attitudes towards different aspects of kaizen. Our assumptions for the questionnaire development are presented in Fig. 2. We made an effort to avoid lengthy statements, ambiguous pronoun references, and negatively worded and connotatively inconsistent statements, as well as to consider the readability of each statement (DeVellis, 2016).

To determine the content validity, we invited seven academics familiar with kaizen and its social aspects to assess the statements, judge the suitability of statements, and check the clarity of wording (DeVellis, 2016). In addition, we led a small pilot focus group of professionals familiar with kaizen to ensure proper interpretation and reduce statement ambiguity. The final version of the questionnaire consists of 17 statements. The respondents were asked to specify if their company implement kaizen and, if it does, to what degree – fully or partially. Our idea was to exclude the questionnaires referring to the companies where the kaizen is not organised. Given that there were no such questionnaires, we further analysed all the filled-out questionnaires we received.

DeVellis (2016) points out that Likert scaling is widely used in instruments measuring opinions, beliefs, and attitudes. We use a five-point Likert scale. Managers were offered responses ranging from 1 – strongly disagree to 5 – strongly agree. Jamieson (2004) points out that Likert scales fall within the ordinal level of measurement and that for ordinal data, one should employ the median or mode as the measure of central tendency. We will base our conclusions on the median and mode, but will also determine and interpret the mean. The five-point Likert scale implies that a median and mean higher than 3.00 indicates that the managers agree with the statement, while a median and mean lower than 3.00 indicates that the managers disagree with the statement. The final part of the questionnaire includes a section on general information about the manager, including gender, age, and education, as well as the legal form and size of the company in which the manager is employed.

2.2 Sample

To develop our sample, we use the following three approaches: i) searching the internet for companies and professionals related to kaizen in Serbia (we use several Serbian terms); ii) investigating the online and hard paper magazines in the areas of business and management; and iii) conversation with the participants at scientific and professional conferences in Serbia. By using these approaches, in 2019,

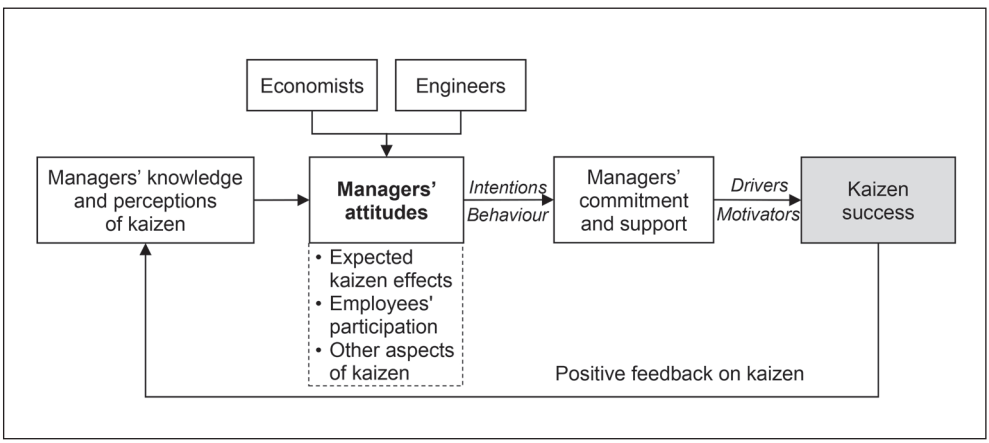

Fig. 2: Assumptions for the questionnaire development

Source: own

we identified 220 manufacturing companies that possibly implemented kaizen. An economist and an engineer from each company in managerial positions were invited to fill out a questionnaire (the potential number of respondents was 440). Our sample consists of 124 managers from 62 companies who filled out the questionnaire, giving a response rate (28.2%) which is high compared to the average for surveys in the social sciences (Vannette & Krosnick, 2018). This is important given that the best way to obtain unbiased estimates is to achieve a high response rate (Fosnacht et al., 2017). All the respondents answered that the company where they work implements kaizen fully (39%) or partially (61%).

Given that the questionnaire was anonymous, we are unable to identify the pairs of respondents

Tab. 1: Sample description

	Number	(%)
Gender		
Men	59	47.6
Women	65	52.4
Age (years)		
Up to 30	22	17.7
31–40	59	47.6
41–50	29	23.4
More than 50	14	11.3
Level of education		
High school	6	4.8
College	15	12.1
Bachelor	93	75.0
Master	10	8.1
Area of expertise		
Economics	52	41.9
Mechanical engineering	26	21.0
Electronics	8	6.5
Other	38	30.6
The legal form of the company		
JSC	11	17.7
LLC	51	82.3
Company size*		
Micro	1	1.6
Small	14	22.6
Medium-sized	24	38.7
Large	23	37.1

Note: *According to the criteria defined in the 2019 Accounting Law of the Republic of Serbia.

Source: own

(one manager and one economist) from each company, i.e., we are unable to connect specific pairs of respondents to a specific company. This is acceptable for our research, given that we examine managers and not companies implementing kaizen. Tab. 1 presents basic information on managers and companies in the sample. The majority of respondents are female (52.4%) and aged less than 40 years (65.3%). The sample mainly includes respondents who have a bachelor's degree (75.0%) and expertise in economics (41.9%) and mechanical engineering (21.0%). The majority of managers work in limited liability companies (82.3%), and in large (37.1%) and medium-sized companies (38.7%).

Our sample allows for the analysis of economists' and engineers' attitudes as CSFs of kaizen. Previous literature often points to the importance of a heterogeneous and multidisciplinary leadership team for the successful implementation of kaizen (Lina & Ullah, 2019; Marin-Garcia et al., 2018; Ramezani & Razmeh, 2014). Ramezani and Razmeh (2014), specifically, stress that the kaizen strategy requires support from a leadership team consisting of all levels of management, including economists, engineers, technicians, and production supervisors. The position of the engineers is very specific. They represent a link between senior management structures, the complex implementation team, and employees (Janjic et al., 2020), and are a critical success or fail factor for their company results (Laglera et al., 2013). They are often the leaders of the kaizen implementation teams and are directly involved in the kaizen implementation, they first notice the effects of kaizen implementation and are in direct contact with the employees, so they are very important in the process of coaching, mentoring, and motivating employees (Janjic et al., 2020). Engineers are especially important for the realisation of the maintenance activities in the implementation stage of kaizen transfer (Yokozawa et al., 2011).

Economists, mostly management accountants, have an important role in kaizen implementation and are usually responsible for performance measurement and monitoring (Fullerton et al., 2013, 2014; Nuhu et al., 2016). Fullerton et al. (2013) point out that management accountants provide information that enables effective employee empowerment and contributes to lean manufacturing implementation, while Fullerton et al. (2014) emphasise that operations management cannot operate in a vacuum and that operations and accounting personnel must partner to ensure that lean management accounting practices are strategically integrated into the lean culture. Cherrafi et al. (2019) similarly argue that performance measurement permits organisations to identify process issues, evaluate the effectiveness of an action plan, and monitor progress towards the goals, while strategic planning supports CI, reflects stakeholders' imperatives, and takes into consideration current performance and challenges faced by an organisation.

2.3 Methods

The data obtained from the questionnaire were analysed using SPSS version 20.0. The analysis was completed using the EFA and Mann-Whitney's U test.

Factor analysis is a statistical tool often used in social sciences to analyse the structure of correlations among a large number of variables (e.g., questionnaire responses) by defining sets of highly interrelated variables known as factors (components). These factors are assumed to represent dimensions within the data that can guide the researcher in creating new composite measures. Factor analysis can achieve its purpose from either an exploratory or confirmatory perspective. We use the exploratory approach as a tool in searching for structure among our variables (Hair et al., 2019).

We use principal components analysis (PCA) as a method for data reduction because we aim to derive a minimum number of factors accounting for the maximum portion of the total variance represented in the variables. In addition, we use varimax as an orthogonal factor rotation method focusing on simplifying the columns in a factor matrix (Hair et al., 2019). Although our sample is relatively small, it meets the minimum requirements for performing factor analysis – we have more than a hundred observations, as well as more than five times more observations (managers) than the analysed variables (statements) in our research (Hair et al., 2019; Tabachnick & Fidell, 2007). Specifically, we have 7.29 times more managers in our sample than statements in our questionnaire.

As factor analysis is based on correlations between measured variables, we estimate Spearman's correlation coefficients. The majority of coefficients between statements are statistically significant and greater than 0.3,

which implies that factor analysis is an appropriate statistical approach for our research (Tabachnick & Fidell, 2007). We also conduct the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests to determine if the data set is suitable for factor analysis. Given that the KMO measure of sampling adequacy is greater than 0.5 (Hair, 2019), i.e., 0.905, and that the approximate chi-square of Bartlett's test of sphericity is 2,112.217, with 136 degrees of freedom, and statistically significant ($p < 0.05$), we conclude that the factor analysis is justified.

Given that our sample consists of economists and engineers, the question arises as to whether there is a statistically significant difference in the attitudes of these two groups of respondents towards kaizen. The question is also if there are differences in the attitudes of women and men. To answer these questions, we use Mann-Whitney's U test.

3. Research results

3.1 Descriptive statistics

Tab. 2 shows the average level of the managers' agreement with each of the statements provided in the questionnaire, along with the standard deviation, median, and mode level of agreement. It also shows the mean of unit-variance scaled data, which is not biased towards variables with larger ranges, as well as the results of a one-sample *t*-test for each statement to find out whether the difference between the means and the level denoting neutral attitude (3.00) is statistically significant.

The statements are sorted by the average level of managers' agreement with each. The managers have the highest average level of agreement with the following statements: i) top management believes that kaizen is important for the continuous improvement of a company (3.99); ii) employees initiate solving minor problems during routine work (3.85); and iii) product quality has improved thanks to kaizen (3.80). On average, the managers agree with 16 statements in the questionnaire, and the average level of their agreement with each statement is lower than four. The mean of unit-variance scaled data leads to slightly different conclusions, although the highest level of managers' agreement is still with the statements concerning the top managers' support of kaizen and employees' involvement in kaizen implementation. The results of the one-sample *t*-test reveal 16 statistically significant and positive differences and one statistically significant and negative difference between the mean attitude and the neutral attitude.

The median level of managers' agreement with the statements is 4 (76.5% of statements) or 3 (23.5% of statements), while the most frequent response to 64.7% of statements is 4. When it comes to the expected effects of kaizen, in support of *H1*, managers believe that kaizen increases product quality, work conditions, and the company's efficiency and reduces the rate of defective products. When it comes to the relationship of managers with employees, managers indicate that the best employees are not announced monthly and that employees' participation in kaizen and other CI activities is only weakly encouraged. Measures of central tendency imply that managers attach relatively little importance to motivating, rewarding, and encouraging employees. Since managers generally have a positive, although relatively weak attitude towards employees' motivation and participation, we land support to *H2* but continue with our analysis.

3.2 Exploratory factor analysis (EFA)

Analysis of the main components in the exploratory factor analysis indicates the presence of three factors with an eigenvalue greater than 1, which cumulatively explain 77.67% of the total variance. Tabachnick and Fidell (2007) point out that the number of factors is usually between the number of variables divided by three and the number of variables divided by five. This is not exactly the case in the present study, given the average of 5.67 variables (statements) per factor. Tabachnick and Fidell (2007) also argue that factors should have at least three variables. Concerning the cumulative percentage of total variance extracted by the factors, Hair et al. (2019) argue that about 60% is satisfactory in social sciences.

Cronbach's α and composite reliability (CR) were used to examine the reliability of scales. As suggested by Hair et al. (2019), both Cronbach's α and CR should be greater than 0.70. The analysis showed Cronbach's α values between 0.86 and 0.96, and CR values between 0.797 and 0.927 for factors identified with EFA. Cronbach's α values suggest that the list of statements has a high degree of internal consistency in measuring the managers' attitudes. The convergent validity is evaluated

Tab. 2: Descriptive statistics

Statements	Mean	SD	SM	Median	Mode	*t*
S1 Top management believes that kaizen is important for the continuous improvement of the company	3.99	1.12	3.58	4	4	9.90
S2 Employees initiate solving minor problems during routine work	3.85	1.05	3.66	4	4	8.96
S3 Product quality has improved thanks to kaizen	3.80	1.19	3.20	4	4	7.48
S4 The general achievement of the goals of kaizen has improved the company's efficiency	3.74	1.10	3.39	4	4	7.49
S5 Work conditions have improved due to kaizen	3.73	1.11	3.38	4	4	7.40
S6 Stakeholders are satisfied with the company's performance	3.73	1.13	3.29	4	4	7.21
S7 Kaizen reduced the rate of defective products	3.72	1.18	3.15	4	5	6.78
S8 There is good vertical and horizontal communication between different levels of the organisational structure	3.71	1.07	3.46	4	4	7.37
S9 Employees are ready to give suggestions for improvements	3.63	1.05	3.47	4	4	6.69
S10 Kaizen motivated the team members in the company	3.55	1.01	3.52	4	4	6.07
S11 The overall activities of kaizen achieved kaizen goals	3.50	1.09	3.22	4	3	5.13
S12 Employee training is conducted to improve interactive skills	3.46	1.08	3.21	4	4	4.75
S13 Employees' participation in kaizen activities is encouraged	3.39	1.10	3.09	3	3	3.94
S14 Employees are motivated to participate through the reward system	3.39	1.17	2.89	3	3	3.67
S15 The internal organisational process has been improved due to kaizen	3.38	1.19	2.83	4	4	3.54
S16 Employees are awarded financial compensation for excellent suggestions for improvements	3.30	1.34	2.46	3	5	2.47
S17 The best employees are announced monthly	2.65	1.32	2.00	3	3	−2.99

Note: The number of respondents for each statement is 124; SD – standard deviation; SM – mean of unit-variance scaled data; *t* – result of the one-sample *t*-test of the significance of the difference between the mean and a neutral attitude (3.00); the results of the one-sample *t*-test are statistically significant at 0.05 (2-tailed).

Source: own

with average variance extracted (AVE), which should not be less than 0.50 (Hair et al., 2019). The analysis showed AVE values between 0.561 and 0.567. Thus, our study also met this criterion.

Tab. 3 presents identified factors, as well as the loadings to identify a particular factor and the percentage of total variance explained by each factor. The loadings above 0.50 (Hair et al., 2019) are usually considered acceptable. Given that the smallest loading is 0.635, all items were included in the final model. As suggested by Hair et al. (2019), we name each of the factors by interpreting the pattern of the factor loadings. Hair et al. (2019) stress that the process of naming the factors is based on the subjective opinion of the researcher and, therefore, subject to criticism.

Tab. 3 shows that the first factor relates to the perceived effects of kaizen, i.e., better product quality, greater stakeholder satisfaction, and increased efficiency. This factor involves

Tab. 3: Results of exploratory factor analysis

Variables (statements)	Factor 1	Factor 2	Factor 3
Factor 1: Perceived effects of kaizen (Cronbach's α: 0.96, CR: 0.927, AVE: 0.561)			
S7 Kaizen reduced the rate of defective products	0.839		
S3 Product quality has improved thanks to kaizen	0.832		
S1 Top management believes that kaizen is important for the continuous improvement of the company	0.814		
S6 Stakeholders are satisfied with the company's performance	0.797		
S4 The general achievement of the goals of kaizen has improved the company's efficiency	0.778		
S5 Work conditions have improved due to kaizen	0.734		
S10 Kaizen motivated the team members in the company	0.698		
S15 The internal organisational process has been improved due to kaizen	0.667		
S11 The overall activities of kaizen achieved kaizen goals	0.652		
S13 Employees' participation in kaizen activities is encouraged	0.643		
Factor 2: Employees' development and motivation (Cronbach's α: 0.86, CR: 0.837, AVE: 0.567)			
S17 The best employees are announced monthly		0.880	
S16 Employees are awarded financial compensation for excellent suggestions for improvements		0.815	
S14 Employees are motivated to participate through the reward system		0.654	
S12 Employee training is conducted to improve interactive skills		0.635	
Factor 3: Employees' participation (Cronbach's α: 0.89, CR: 0.797, AVE: 0.570)			
S9 Employees are ready to give suggestions for improvements			0.836
S2 Employees initiate solving minor problems during routine work			0.770
S8 There is good vertical and horizontal communication between different levels of the organisational structure			0.647
% of total variance explained	62.545	8.960	6.167

Note: The extraction method is the principal component analysis and a rotation method is varimax; a total of 124 respondents expressed their attitude towards each statement; CR – composite reliability; AVE – average variance extracted.

Source: own

ten variables and explains 62.545% of the variance. The second factor is named employees' development and motivation. This factor includes four variables and explains 8.960% of the variance. The third factor includes three variables, explains 6.167% of the variance, and refers to employees' participation.

Identification of the factors using EFA reveals critical areas to which attention should be paid to ensure more efficient and effective management and long-term kaizen effects. The first factor shows that managers believe that kaizen has a positive impact on business, which implies that they have a positive attitude towards kaizen as an idea and its implementation. This is in support of *H1*. The second and third factors refer to the managers' attitudes towards participation and position of the employees, and the importance of the employees for kaizen success. We support our *H2* but confirm the results of descriptive statistics that managers possibly do not pay enough attention to employees' motivation and participation.

3.3 Results of Mann-Whitney's U test

Results of Mann-Whitney's U test show that there is no statistically significant difference in attitudes of economists and engineers towards the different aspects of kaizen: perceived effects of kaizen (U = 1603.5, $z = -0.611$, $p = 0.541$); employees' development and motivation (U = 1663, $z = -0.288$, $p = 0.773$), and employees' participation (U = 1514, $z = -1.105$, $p = 0.269$). Also, there is no statistically significant difference in the attitudes of women and men: perceived effects of kaizen (U = 1759, $z = -0.795$, $p = 0.427$), employees' development and motivation (U = 1782.5, $z = -0.678$, $p = 0.498$), and employees' participation (U = 1817.5, $z = -0.505$, $p = 0.613$). Such results can be explained by the fact that our research involves mostly highly educated persons under the age of 40, employed in medium-sized and large companies, and familiar with modern tendencies in business.

4. Discussions

Our research contributes to the literature on employees' and managers' attitudes towards kaizen (Garza-Reyes et al., 2022; Janjic et al., 2020; Liu et al., 2015; Oropesa-Vento et al., 2016). It relies on the assumption that the managers' attitudes towards kaizen are their main drivers and motivators, which determine their behaviour, the decisions they make, and consequently the success of kaizen. It is in line with Oropesa-Vento et al. (2016), who find that the managers' attitudes are important for kaizen success, and Ahlstrom et al. (2021), who argue that lean companies can improve soft skills practices, engagement of employees, and social outcomes.

It is encouraging that managers in our sample express the highest average level of agreement with the statement on the importance of kaizen. This means that they generally have a positive attitude towards the idea and effects of kaizen, which implies that they are committed to kaizen. This is important since managers' commitment and support are often considered to be CSFs of kaizen (Garcia et al., 2014; Glover et al., 2011; Janjic et al., 2020; Oropesa-Vento et al., 2016). Nevertheless, managers' agreement with the statement is only moderate and indicates a need to improve their knowledge and motivation. Oropesa-Vento et al. (2016) find a similar level of commitment, while Liu et al. (2015) find that managers' commitment is generally not perceived as an important inhibitor or enabler of kaizen event effectiveness. Given the different results and conclusions of previous studies on the importance and influence of managers' attitudes on their behaviour and kaizen effects, our study contributes to the literature by showing managers' commitment to kaizen.

EFA confirms that managers have a positive attitude towards the idea of kaizen. Such an attitude of the managers has a positive impact on the level of their motivation and behaviour in the process of kaizen implementation. Improving company business and performance is the primary responsibility of the managers, meaning that the managers should consider their own strengths and weaknesses, and accordingly take the activities necessary for self-improvement. This finding confirms that managers' attitudes and motivation are CSFs of kaizen requiring special attention in the process of kaizen implementation. This is in line with the conclusion of some previous studies (Garcia et al., 2014; Glover et al., 2011; Oropesa-Vento et al., 2016).

We find a lower level of managers' agreement with the statements concerning employees' motivation and participation. Previous studies suggest a direct link between managers' commitment, employees' participation, and

kaizen performance (Garcia et al., 2013; Hailu et al., 2017; Yokozawa & Steenhuis, 2013). This means that managers should pay more attention to employees' participation, which is considered fundamental in the context of kaizen (Alvarado-Ramirez et al., 2018; Carnerud et al., 2018). Indirectly, the managers' attitudes towards employees' participation are a reflection of their level of knowledge and indicate the necessity for professional development. It should also be noted that more effective kaizen implementation will have positive effects on managers and employees. Cheser (1998) suggests that kaizen increases job enrichment and employee motivation, and may move employees to higher levels of growth need strength. Managers should address the employees with the message: you are important, you are the key link, and develop a sense of belonging to the kaizen team.

Another important contribution of our study is the analysis of the differences in the attitudes of economists and engineers towards kaizen. The economists and engineers in our sample generally have a similar attitude towards certain aspects of kaizen. If their attitudes were found to be significantly different, this could be understood as an indication of differences in their knowledge of and commitment to kaizen, which could consequently impede the process of kaizen implementation. That could also be an indication of a need for better preparation of the kaizen team and coaching and training of managers with a certain background. Everyone in the kaizen team has a certain place and role. We emphasise the role of economists and engineers. The role of economists and, above all, management accountants, is crucial from the perspective of measuring kaizen effects. It is, nevertheless, important to emphasise the role of the engineers in kaizen implementation.

Special attention should be paid to the selection of engineers for project teams, as well as to their knowledge, experience, and competencies. Ktoridou et al. (2019) argue that engineering managers are distinguished from other managers as they have the ability to apply engineering principles and skills in organising and managing people and projects. Engineers are required to transition into managerial and leadership roles more quickly than ever before (Nittala & Jesiek, 2018) and to have an understanding of both the technical and business aspects of organisations (Riley et al., 2013). However, Riley and Cudney (2015) find that engineers often experience challenges in communication, conflict resolution, and leadership, and, therefore, use defensive routines more commonly than non-engineering managers. Ortiz (2006) stresses that kaizen is not a fly-by-night idea that goes away when management and engineers are not comfortable adapting to change. Changes need to be accepted by everyone and at all hierarchical levels starting with top managers.

Conclusions

Our study aims to examine the manager's attitudes towards different aspects of kaizen, their commitment to the idea of kaizen, and their attitude towards the motivation and participation of employees. Our results show a moderate level of managers' agreement with the statements on the importance and effects of kaizen, and a relatively low level of agreement with the statements on employees' participation and motivation. They indicate a low to moderate level of managers' knowledge and perception of kaizen, and consequently of managers' commitment and support to kaizen. Our results also show that managers' attitudes towards kaizen can be grouped into three areas requiring special attention: perceived kaizen effects, employees' development and motivation, and employees' participation. Finally, we find that economists and engineers do not differ in their attitudes towards kaizen, which indicates their similar and common knowledge of and commitment to certain aspects of kaizen. We emphasise the role of the engineers in kaizen implementation, and the importance of their selection, knowledge, experience, and competencies.

By answering the research questions posed in the introduction, our study provides significant theoretical and practical contributions. The first theoretical contribution of our study is a comprehensive analysis of managers' attitudes towards the CSFs of kaizen. This is important since we find only a few studies examining managers' or employees' attitudes towards kaizen or CSFs of kaizen. Given that we focus on managers and employees as major participants in kaizen implementation, our study's second theoretical contribution is identifying the areas requiring more attention from the managers to support social aspects of kaizen implementation and its long-term effects. This is important as only a few studies examine the social aspects of building sustainable

kaizen within a company or achieving sustainable kaizen effects. The third theoretical contribution of our study is an empirical investigation of the managers' attitudes towards employees' participation, as well as towards employees' education and training, and the identification of the problematic areas in this respect. This is important since studies on managers' approaches to employee participation are relatively scarce. Our study also complements scarce literature on the specific individual-level factors and their interaction with organisation-level factors in driving kaizen activities, as well as the literature on the influence of motivation and attitudes on work performance. Finally, it should be noted that the failure of numerous kaizen implementations points to the need for additional research on the CSFs of kaizen. By focusing on managers' attitudes as CSF of kaizen, our study makes an additional contribution to the existing literature.

Although our study does not consider the direct impact of a specific socio-economic environment on kaizen implementation, it can be beneficial to companies in economies similar to Serbian. Our results indicate the problems of insufficient motivation or resistance to change, as well as a low level of managers' interest in the empowerment of employees. The problem is arguably the mentality of people in Serbia and the Serbian cultural and political heritage that needs to be managed. Management teams for kaizen implementation should deal with the specifics of the environment in which the company operates and accordingly manage the implementation process. Previous studies point to the specificities of business changes in transitioning economies (Todorovic & Cupic, 2017) and the importance of socio-economic and national context to the success of kaizen implementation (Lina & Ullah, 2019). Companies in transitioning economies, like Serbian, also face the problem of inadequate managers' and employees' participation in the processes of continuous improvement (Janjic et al., 2020). Hence, our results may be of particular relevance to companies in countries with similar national contexts. Investigating the managers' and employees' attitudes in these countries can be considered even more significant than in developed countries. We, therefore, believe that the influence of the socio-economic environment should be examined in more detail in future studies.

Our paper has significant practical implications. The study results point to the need to analyse and shape managers' attitudes and explore the connection between managers' attitudes, their behaviour, and kaizen success. They also point to the importance and specificities of the relationship between managers' attitudes and employees' participation and commitment. The results, therefore, imply that companies considering and initialising kaizen implementation should identify and understand managers' attitudes towards various aspects of kaizen in order to develop guidance for problem-solving and successful kaizen implementation. The study results could also be of importance to companies that have already implemented kaizen, but have a problem with its sustainability. They could guide the process of improving kaizen activities and help identify CSFs of kaizen implementation related to managers' attitudes in order to answer the question of why the implementation of kaizen sometimes fails or does not produce the expected results.

Although our study confirms the findings of some previous studies that managers' attitudes are one of the CSFs of kaizen implementation, by analysing the attitudes of engineers and economists, we make a significant step forward. The study results point to the necessity of forming a cross-functional kaizen implementation team and a careful approach to choosing its members. It is necessary to involve the engineers who represent a link between senior management structures, the implementation team, and employees. Attention should also be paid to the involvement of economists, who are crucial in the processes of performance measurement and monitoring. Additionally, the study results could be used to change the perceptions of managers (engineers and economists). The recommendation is to empower managers and employees, and continuously work on education and training, especially in the areas of change management.

Although kaizen is one of the continuous improvement programmes, it should be noted that the study results can be used to support and improve the sustainability of various improvement programmes. In addition to already mentioned, companies are expected to build an adequate reward system, especially in the initial stages of programme implementation, and to efficiently and effectively communicate the results to lower levels of management

regarding initial and subsequent effects in order to build a positive attitude towards innovation and increase the level of trust. Both individual benefits and benefits for the company as a whole should be pointed out, given that the managers and employees should believe that the improvement programme is in their interest and the interest of the company. Finally, a detailed methodological framework used in the study, in existing or partially modified form, can serve practitioners when analysing specific companies before starting the kaizen or some other programme implementation.

The research conducted in the study has several limitations. According to some authors, the recommended sample size for factor analysis is at least 300 participants (Hair et al., 2019). This makes sample size potentially the most important limitation of our research. In addition, the sample includes companies from only one country. A larger sample with a larger number of variables would possibly give different results. The data collected using the questionnaire refers to only one point in time and does not reflect the possible influence of some recent events, such as the COVID-19 pandemic. Given that the managers' attitudes are possibly influenced by the trending component, future research could rely on the multiyear survey allowing the comparisons and drawing more generally valid conclusions. Another limitation is related to our objective inability to fully identify and neutralise the answers that, intentionally or unintentionally, do not reflect respondents' attitudes and facts concerning them. Hence, more detailed results could have been obtained if the interview was used in addition to the questionnaire. Future research should pay particular attention to identifying CSFs of kaizen implementation relevant to developing and transitioning economies. A more advanced statistical methodology can also be used, like regression analysis of the influence that managers' attitudes have on kaizen implementation and effects.

References

Ahlstrom, P., Danese, P., Hines, P., Netland, T. H., Powell, D., Shah, R., Thürer, M., & van Dun, D. H. (2021). Is lean a theory? Viewpoints and outlook. *International Journal of Operations & Production Management*, *41*(12), 1852–1878. https://doi.org/10.1108/ijopm-06-2021-0408

Ahuja, J., Panda, T. K., Luthra, S., Kumar, A., Choudhary, S., & Garza-Reyes, J. A. (2019). Do human critical success factors matter in adoption of sustainable manufacturing practices? An influential mapping analysis of multi-company perspective. *Journal of Cleaner Production*, *239*, 117981. https://doi.org/10.1016/j.jclepro.2019.117981

Aletaiby, A. A., Rathnasinghe, A. P., & Kulatunga, P. (2021). Influence of top management commitment towards the effective implementation of TQM in Iraqi oil companies. *Journal of Petroleum Exploration and Production Technology*, *11*(4), 2039–2053. https://doi.org/10.1007/s13202-021-01131-3

Alvarado-Ramírez, K. M., Pumisacho-Álvaro, V. H., Miguel-Davila, J. Á., & Suárez Barraza, M. F. (2018). Kaizen, a continuous improvement practice in organizations: A comparative study in companies from Mexico and Ecuador. *The TQM Journal*, *30*(4), 255–268. https://doi.org/10.1108/tqm-07-2017-0085

Aoki, K. (2008). Transferring Japanese Kaizen activities to overseas plants in China. *International Journal of Operations and Production Management*, *28*(6), 518–539. https://doi.org/10.1108/01443570810875340

Argiyantari, B., Simatupang, T. M., & Basri, M. H. (2022). Transportation performance improvement through lean thinking implementation. *International Journal of Lean Six Sigma*, *13*(3), 622–647. https://doi.org/10.1108/ijlss-06-2020-0075

Bakotic, D., & Rogosic, A. (2017). Employee involvement as a key determinant of core quality management practices. *Total Quality Management and Business Excellence*, *28*(11–12), 1209–1226. https://doi.org/10.1080/14783363.2015.1094369

Beraldin, A. R., Danese, P., & Romano, P. (2019). An investigation of the relationship between lean and well-being based on the job demands-resources model. *International Journal of Operations and Production Management*, *39*(12), 1295–1322. https://doi.org/10.1108/ijopm-05-2019-0377

Buren, P. (2021). *The role of a manager when implementing improvement programs: Reflecting on kaizen, lean/agile production and supply chain management*. Academia. https://www.academia.edu/31987151/the_role_of_a_manager_when_implementing_improvement_programs_reflecting_on_kaizen_lean_agile_production_and_supply_chain?auto=download

Bwemelo, G. (2014). Kaizen as a strategy for improving SSMEs' performance: Assessing its acceptability and feasibility in Tanzania. *European Journal of Business and Management*, *6*(35), 79–91.

Carnerud, D., Jaca, C., & Bäckström, I. (2018). Kaizen and continuous improvement – Trends and patterns over 30 years. *The TQM Journal*, *30*(4), 371–390. https://doi.org/10.1108/tqm-03-2018-0037

Cherrafi, A., Elfezazi, S., Hurley, B., Garza-Reyes, J. A., Kumar, V., Anosike, A., & Batista, L. (2019). Green and lean: A Gemba-Kaizen model for sustainability enhancement. *Production Planning & Control*, *30*(5–6), 385–399. https://doi.org/10.1080/09537287.2018.1501808

Cheser, R. N. (1998). The effect of Japanese kaizen on employee motivation in U.S. manufacturing. *The International Journal of Organizational Analysis*, *6*(3), 197–217. https://doi.org/10.1108/eb028884

Deressa, A. T., & Zeru, G. (2019). Work motivation and its effects on organizational performance: The case of nurses in Hawassa public and private hospitals: Mixed method study approach. *BMC Research Notes*, *12*(1). https://doi.org/10.1186/s13104-019-4255-7

DeVellis, R. F. (2016). *Scale development: Theory and applications*. Sage publications.

Fosnacht, K., Sarraf, S., Howe, E., & Peck, L. K. (2017). How important are high response rates for college surveys? *The Review of Higher Education*, *40*(2), 245–265. https://doi.org/10.1353/rhe.2017.0003

Fullerton, R. R., Kennedy, F. A., & Widener, S. K. (2013). Management accounting and control practices in a lean manufacturing environment. *Accounting, Organizations and Society*, *38*(1), 50–71. https://doi.org/10.1016/j.aos.2012.10.001

Fullerton, R. R., Kennedy, F. A., & Widener, S. K. (2014). Lean manufacturing and firm performance: The incremental contribution of lean management accounting practices. *Journal of Operations Management*, *32*(7–8), 414–428. https://doi.org/10.1016/j.jom.2014.09.002

Garcia, J. L., Maldonado, A. A., Alvarado, A., & Rivera, D. G. (2014). Human critical success factors for kaizen and its impacts in industrial performance. *The International Journal of Advanced Manufacturing Technology*, *70*(9–12), 2187–2198. https://doi.org/10.1007/s00170-013-5445-4

Garcia, J. L., Rivera, D. G., & Iniesta, A. A. (2013). Critical success factors for Kaizen implementation in manufacturing industries in Mexico. *The International Journal of Advanced Manufacturing Technology*, *68*(1–4), 537–545. https://doi.org/10.1007/s00170-013-4750-2

Garza-Reyes, J. A., Christopoulos, C., Kumar, A., Luthra, S., González-Aleu, F., Kumar, V., & Villarreal, B. (2022). Deploying Kaizen events in the manufacturing industry: An investigation into managerial factors. *Production Planning & Control*, *33*(5), 427–449. https://doi.org/10.1080/09537287.2020.1824282

Glover, W. J., Farris, J. A., Van Aken, E. M., & Doolen, T. L. (2011). Critical success factors for the sustainability of kaizen event human resource outcomes: An empirical study. *International Journal of Production Economics*, *132*(2), 197–213. https://doi.org/10.1016/j.ijpe.2011.04.005

Hailu, H., Kedir, A., Bassa, G., & Jilcha, K. (2017). Critical success factors model developing for sustainable Kaizen implementation in manufacturing industry in Ethiopia. *Management Science Letters*, *7*(12), 585–600. https://doi.org/10.5267/j.msl.2017.8.006

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis*. Cengage Learning EMEA.

Imai, M. (1986). *Kaizen: The key to Japan's competitive success*. McGraw–Hill.

Jamieson, S. (2004). Likert scales: How to (ab) use them. *Medical Education*, *38*(12), 1217–1218. https://doi.org/10.1111/j.1365-2929.2004.02012.x

Janjic, V., Todorovic, M., & Jovanovic, D. (2020). Key success factors and benefits of kaizen implementation. *Engineering Management Journal*, *32*(2), 98–106. https://doi.org/10.1080/10429247.2019.1664274

Jurburg, D., Viles, E., Tanco, M., & Mateo, R. (2017). What motivates employees to participate in continuous improvement activities? *Total Quality Management & Business Excellence*, *28*(13–14), 1469–1488. https://doi.org/10.1080/14783363.2016.1150170

Jurburg, D., Viles, E., Tanco, M., Mateo, R., & Lleó, Á. (2019). Understanding the main organisational antecedents of employee participation in continuous improvement. *The TQM Journal*, *31*(3), 359–376. https://doi.org/10.1108/tqm-10-2018-0135

Karacsony, P., Metzker, Z., Vasic, T., & Koltai, J. P. (2023). Employee attitude to organisational change in small and medium-sized enterprises. *E&M Economics and Management*, *26*(1), 94–110. https://doi.org/10.15240/tul/001/2023-1-006

Kharub, M., Gupta, H., Rana, S., & McDermott, O. (2023). Employee's performance and Kaizen events' success: Does supervisor behaviour play a moderating role? *The TQM Journal*, *35*(8), 2336–2366. https://doi.org/10.1108/tqm-06-2022-0203

Ktoridou, D., Doukanari, E., & Karayiannis, A. (2019). Educating the new generation of engineering managers to stay relevant in the 21st century workforce. In *Proceedings of 2019 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1547–1551). https://doi.org/10.1109/educon.2019.8725177

Laglera, J.-L. M., Collado, J. C., & de Oca, J.-A. M. M. (2013). Effects of leadership on engineers: A structural equation model. *Engineering Management Journal*, *25*(4), 7–16. https://doi.org/10.1080/10429247.2013.11431991

Lina, L. R., & Ullah, H. (2019). The concept and implementation of kaizen in an organization. *Global Journal of Management and Business Research*, *19*(1), 9–17.

Liu, W.-H., Asio, S., Cross, J., Glover, W. J., & Van Aken, E. (2015). Understanding team mental models affecting Kaizen event success. *Team Performance Management*, *21*(7/8), 361–385. https://doi.org/10.1108/tpm-03-2015-0012

Macpherson, W. G., Lockhart, J. C., Kavan, H., & Iaquinto, A. L. (2015). Kaizen: A Japanese philosophy and system for business excellence. *Journal of Business Strategy*, *36*(5), 3–9. https://doi.org/10.1108/jbs-07-2014-0083

Marin-Garcia, J. A., Juarez-Tarraga, A., & Santandreu-Mascarell, C. (2018). Kaizen philosophy: The keys of the permanent suggestion systems analyzed from the workers' perspective. *The TQM Journal*, *30*(4), 296–320. https://doi.org/10.1108/tqm-12-2017-0176

Marksberry, P., Badurdeen, F., Gregory, B., & Kreafle, K. (2010). Management directed kaizen: Toyota's Jishuken process for management development. *Journal of Manufacturing Technology Management*, *21*(6), 670–686. https://doi.org/10.1108/17410381011063987

Mohammad, I. S., & Oduoza, C. F. (2020). Lean-excellence business management for manufacturing SMEs focusing on KRI. *International Journal of Productivity and Performance Management*, *69*(3), 519–539. https://doi.org/10.1108/ijppm-11-2018-0389

Nguyen, H. A., Yokozawa, K., & Suárez-Barraza, M. F. (2023). A sense of urgency as a driver of individual kaizen performance: Moderating role of organizational culture. *The TQM Journal* (in press). https://doi.org/10.1108/tqm-06-2023-0169

Nittala, S., & Jesiek, B. K. (2018). Work experiences of engineering managers: Challenges, strategies, competencies. In *Proceedings of 2018 IEEE Frontiers in Education Conference (FIE)*. https://doi.org/10.1109/fie.2018.8658499

Nuhu, N. A., Baird, K., & Appuhami, R. (2016). The association between the use of management accounting practices with organizational change and organizational performance. In *Advances in Management Accounting* (Vol. 26, pp. 67–98). Emerald Group Publishing Limited.

Oropesa-Vento, M., García Alcaraz, J. L., Maldonado Macías, A. A., & Martínez Loya, V. (2016). The impact of managerial commitment and Kaizen benefits on companies. *Journal of Manufacturing Technology Management*, *27*(5), 692–712. https://doi.org/10.1108/jmtm-02-2016-0021

Ortiz, C. A. (2006). *Kaizen assembly: Designing, constructing, and managing a lean assembly line*. CRC Press. https://doi.org/10.1201/9781420006605

Paipa-Galeano, L., Bernal-Torres, C. A., Agudelo Otálora, L. M., Jarrah Nezhad, Y., & González-Blanco, H. A. (2020). Key lessons to maintain continuous improvement: A case study of four companies. *Journal of Industrial Engineering and Management*, *13*(1), 195–211. https://doi.org/10.3926/jiem.2973

Ramezani, A., & Razmeh, A. P. (2014). Kaizen and kaizen costing. *International Journal of Accounting Research*, *2*(8), 43–52.

Riley, T., & Cudney, E. A. (2015). Defensive routines in engineering managers and non-engineering managers – A case analysis. *International Journal of Engineering Business Management*, *7*(7–8), 8. https://doi.org/10.5772/60114

Riley, T., Cudney, E., & Long, S. (2013). A comparative analysis of defensive routines in engineering managers versus non-engineering managers. *Engineering Management Journal*, *25*(4), 44–51. https://doi.org/10.1080/10429247.2013.11431994

Rivera-Mojica, D., & Rivera-Mojica, L. (2014). Critical success factors for Kaizen implementation. In J. Garcia-Alcaraz, A. Maldonado-Macías, & G. Cortes-Robles (Eds.), *Lean manufacturing in the developing world* (pp. 157–178). Springer International Publishing. https://doi.org/10.1007/978-3-319-04951-9_8

Singh, J., & Singh, H. (2015). Continuous improvement philosophy – Literature review and directions. *Benchmarking: An International Journal*, *22*(1), 75–119. https://doi.org/10.1108/bij-06-2012-0038

Stacho, Z., Stachová, K., Lukáč, M., Kupec, V., & Petrů, N. (2023). Management reflections on innovations in digitalization, with an emphasis on degree of work autonomy. *E&M Economics and Management*, *26*(1), 78–93. https://doi.org/10.15240/tul/001/2023-1-005

Suarez-Barraza, M. F., Miguel-Davila, J., & Castillo-Arias, I. (2011). The implementation of Kaizen in Mexican organizations: An empirical study. *Journal of Globalization, Competitiveness, and Governability*, *5*(1), 60–74. https://doi.org/10.3232/gcg.2011.v5.n1.04

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Pearson Education.

Tafvelin, S., von Thiele Schwarz, U., Nielsen, K., & Hasson, H. (2019). Employees' and line managers' active involvement in participatory organizational interventions: Examining direct, reversed, and reciprocal effects on well-being. *Stress and Health*, *35*(1), 69–80. https://doi.org/10.1002/smi.2841

Todorovic, M., & Cupic, M. (2017). How does 5s implementation affect company performance? A case study applied to a subsidiary of a rubber goods manufacturer from Serbia. *Engineering Economics*, *28*(3), 311–322. https://doi.org/10.5755/j01.ee.28.3.16115

Todorovic, M., Cupic, M., & Jovanovic, D. (2022). Sustainable lean implementation: A study of Serbian companies. *Economic Annals*, *67*(234), 81–107. https://doi.org/10.2298/eka2234081t

Vannette D. L., & Krosnick J. A. (2018). *The Palgrave handbook of survey research*. Palgrave Macmillan.

Verbickas, D. (2021). Research on Kaizen implementation in industrial companies. *Mokslas – Lietuvos Ateitis*, *13*, 1–16. https://doi.org/10.3846/mla.2021.14340

Wu, T.-J., & Wu, Y. J. (2019). Innovative work behaviors, employee engagement, and surface acting: A delineation of supervisor-employee emotional contagion effects. *Management Decision*, *57*(11), 3200–3216. https://doi.org/10.1108/md-02-2018-0196

Yokozawa, K., Steenhuis, H. J., & Bruijn, E. J. (2011). Process of international kaizen transfer in the Netherlands. *Journal of Japanese Operations Management and Strategy*, *2*(1), 38–57.

Yokozawa, K., & Steenhuis, H.-J. (2013). The influence of national level factors on international kaizen transfer: An exploratory study in The Netherlands. *Journal of Manufacturing Technology Management*, *24*(7), 1051–1075. https://doi.org/10.1108/jmtm-05-2011-0046