VILNIUS UNIVERSITY
BUSINESS SCHOOL

INTERNATIONAL PROJECT MANAGEMENT PROGRAMME

Gerda Pociūnaitė

MASTER'S THESIS

Darbuotojų įsitraukimo į Kaizen veiklą faktoriai gamybos įmonėje Lietuvoje	***Factors of Employee Involvement in Kaizen in Lithuanian Manufacturing Company***

Student _____

(signature)

Supervisor _____

(signature)

Assoc. prof. dr Dalia Bagdžiūnienė

Vilnius, 2021 m.

TABLE OF CONTENT

SUMMARY

VILNIUS UNIVERSITY BUSINESS SCHOOL

INTERNATIONAL PROJECT MANAGEMENT PROGRAMME

Author of diploma paper:	Gerda Pociūnaitė
The full title of diploma paper:	Factors of Employee Involvement in *Kaizen* in Lithuanian Manufacturing Company
Diploma paper advisor:	Assoc. prof. dr Dalia Bagdžiūnienė
Presented at:	Work prepared in Vilnius, 2021 m.
Number of pages:	66
Number of Tables:	4
Number of Figures:	19
Number of Appendixes:	0

This Master's thesis focuses on various factors, which impact employees' involvement in one of the Lean tools – *Kaizen*, as well as what benefits employee involvement in *Kaizens* brings to the company and employees themselves.

Master's thesis aim is to identify the main factors of employee involvement in *Kaizen* in a Lithuanian manufacturing company.

The objectives include analysis of thesis-related scientific literature, identification of the company, and personal (employee) derived factors of employee involvement in *Kaizen*. Also to find out what benefits to the company and employees involvement in *Kaizen* brings. Additionally, conclusions and recommendations for the company were provided, based on the empirical results.

A quantitative research method was used to conduct this study. Data was collected using a questionnaire at the manufacturing company in Lithuania, which operates according to Lean principles.

Research results confirmed other findings, discussed in the literature analysis. Research confirmed that all identified factors were significantly contributing to employee involvement in *Kaizen*, with process control, training, and management being the main factors for the company participating in this research.

SANTRAUKA

VILNIAUS UNIVERSITETO VERSLO MOKYKLA

TARPTAUTINĖS PROJEKTŲ VADYBOS PROGRAMA

Baigiamojo darbo autorius:	Gerda Pociūnaitė
Pilnas baigiamojo darbo pavadinimas:	Darbuotojų įsitraukimo į *Kaizen* veiklą faktoriai gamybos įmonėje Lietuvoje
Baigiamojo darbo vadovas:	Assoc. prof. dr Dalia Bagdžiūnienė
Baigiamojo darbo atlikimo vieta ir metai:	Darbas parengtas 2021 m. Vilniuje
Puslapių skaičius	66
Lentelių skaičius:	4
Paveikslų skaičius:	19
Priedų skaičius:	0

Šiame magistro darbe tyrinėjami faktoriai, nulemiantys darbuotojų įsitraukimą į vieną iš Lean verslo valdymo metodologijos įrankių – *Kaizen*. Taip pat aiškinamasi kokia naudas dalyvavimas Kaizenuose suteikia įmonei ir darbuotojams.

Magistrinio darbo tikslas yra nustatyti faktorius, kurie nulemia darbuotojų įsitraukimą į Kaizenus gamybos įmonėje Lietuvoje.

Tikslai apima su darbo tema susijusių literatūrinių šaltinių analizę, identifikuoti kokie įmonės faktoriai daro įtaką darbuotojų įsitraukimui į Kaizenus ir kokie pačių darbuotojų faktoriai taip pat nulemia jų įsitraukimą. Identifikuojamos naudos, kurias darbuotojų įsitraukimas į Kaizenus suteikia įmonei, bei darbuotojams. Taip pat pateikiamos išvados ir rekomendacijos kaip pagerinti darbuotojų įsitraukimą.

Magistriniame darbe naudojama kiekybinio tyrimo metodologija, analizuojami duomenys surinkti nuotolinės apklausos metu gamybinėje įmonėje Lietuvoje, kuri vadovaujasi Lean metodologija.

Magistrinio darbo rezultatai koreliuoja su ankstesnių studijų rezultatais. Patvirtinta, kad identifikuoti įmonės ir darbuotojų faktoriai daro reikšmingą įtaką darbuotojų įsitraukimui į *Kaizen*us. Nustatyti didžiausią įtaką darbuotojų įsitraukimui darantys faktoriai: proceso kontrolė, mokymai ir vadovavimas.

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This work describes research about what determines employee willingness to get involved in Lean activities, in particular *Kaizen*. The study aimed to identify what factors from the company and personal factors of employees determine employees' determination and motivation to be involved in *Kaizen*, combining the workflow analysis in Lean with well-being improvement activities. The methodology builds on value stream mapping and aims to provide solutions on how can employee involvement rates be improved.

A Lean system is about creating more value for the user by using (wasting) less time, energy, material work, equipment, and effort. This approach is formed from the point of view of the user. The consumer can be not only the final buyer of a product or service but also the next process that follows me. The way Lean thinks and acts helps organizations become both innovative and competitive, and more sustainable in the long run. The *Kaizen* strategy aims to involve workers from multiple functions and levels in the organization in working together to address a problem or improve a process. The team uses analytical techniques, such as value stream mapping and "the 5 whys", to identify opportunities quickly to eliminate waste in a targeted process or production area. The team works to implement chosen improvements rapidly (often within 72 hours of initiating the *Kaizen* event), typically focusing on solutions that do not involve large capital outlays (Garcia-Alcaraz, Oropesa-Vento, & Maldonado-Macias, 2017).

Kaizen methodology is based on the implementation of improvements to all processes and aspects of the business. *Kaizen* also provides benefits to employees who participate in this activity. Benefits include simplified and easier The *Kaizen* management represents a solid strategic instrument, to reach and surpass the company’s objectives. The *Kaizen* management is dedicated to the improvement of productivity, efficiency, quality, and overall well-being of the business.

The evaluation shows that *Kaizen* provides new insights, which help employees identify and implement improvements, and that these improvements most often have a positive effect on both well-being and production. Employee participation is crucial, but external facilitator assistance to the wards is needed for proper implementation.

Demands increased productivity on the part of the staff. Staff experience constant pressure to deliver more, make faster decisions, and coordinate with an increasing number of other professions and units, both in and outside the manufacturing company (Carmeli & Gittell, 2009). This development may have adverse consequences for the staff, such as increased work overload, stress, and burnout, given that they feel hampered in delivering the required quality of care to the manufacturing process (Westgaard & Winkel,

2011). Employee participation is emphasized in the Lean philosophy, yet it may not always be stressed in practice (Hasle, 2012). Importantly, previous research suggests that it may have positive effects for the employees (Bamber, et al. 2014); (Cullinane, et al. 2014).

The *Kaizen* Method has been particularly distinguished as the best method of performance improvement within companies since the implementation costs were minimal. It is nowadays more than ever that the relationship between manager and employee is crucial and the *Kaizen* technique has a major contribution to the reinforcement of this relationship since the achievements of a company are the results of the mixed efforts of each employee.

These methods bring together all the employees of the company ensuring the improvement of the communication process and the reinforcement of the feeling of membership. The companies that want to have a performance must keep their leader position on the market by increasing the quality level of services provided, reducing costs, and last but not least motivating the whole staff to implement the concept of performance-oriented organization.

Kaizen is a solid strategic instrument that is used to achieve and overcome the company's objectives. In this study, our contribution consists of focusing on a processes industry about which very few studies have been published. Various studies were published by Bonavia and Marin-Garcia in 2009, 2011, and 2015 highlighting *Kaizen* implementation in Spanish companies to improve the overall performance (Marin-Garcia, Garcia-Sabater and Bonovia, 2009); (Bonavia and Marin-Garcia, 2011); (Marin-Garcia and Bonavia, 2015). Therefore, this research aims to investigate the effect employee involvement has on LM, and the effect LM practices have on performance in a process industry.

The present study makes it possible to extend the existing results on LM by using an industry that is different from the ones usually analyzed, but that has many of the necessary characteristics for implementing LM. The quantitative research model was chosen to conduct this study.

The research aim is to identify factors of employee involvement in *Kaizen* in a Lithuanian manufacturing company.

Research Objectives:

1. To determine company factors of employee involvement in *Kaizen*.
2. To determine employee factors of their involvement in *Kaizen*.
3. To determine the benefits of employee involvement in *Kaizen* to the company.

4. To determine the benefits of the involvement in *Kaizen* projects for employees.
5. To prepare conclusions and practical recommendations for improving employee involvement in *Kaizen* projects in a Lithuanian manufacturing company.

Factors of employee engagement in *Kaizen* projects were not specifically researched before. According to previous studies, several potential factors contributing to employee engagement in Lean environment were adopted for this study for employee engagement in *Kaizen*.

Master's Thesis consists of the following parts:

- Section 1: Literature analysis thesis related topics;
- Section 2: Description of research methodology, including data gathering methods, research background, scope, and sample.
- Section 3: Research results, their analysis, and research limitations.
- The thesis is concluded by conclusions and recommendations, followed by a bibliography.

1. THEORETICAL BACKGROUND OF THE STUDY

1.1 *Kaizen* as a project

Terminology greatly depends on each company. Many companies refer to *Kaizen* as a continuous improvement project or series of projects as described by Vivan et al (Vivan, Huertas Ortiz, & Paliari, 2016). After a literature review, it was established that most authors refer to *Kaizen* projects simply as *Kaizen*. In general *Kaizen* and a standard project has the same components and structures. A project manager and a *Kaizen* leader are responsible for managing their respective teams and resources (Arcidiacono, Calabrese and Yang, 2012); (Chafee, 1993). The team is selected by the project manager/*Kaizen* leader and usually consists of specialists from different fields, who will work on situation analysis, implementation of the improvement, and monitoring after the improvement was implemented. Both *Kaizen* and the regular project have a budget and deadline. Both *Kaizen* and project ideas usually should be represented and approved by a designated board. For regular projects, the project charter is usually prepared. For *Kaizen*, the leader also must fill a table or form. This form varies from company to company but also covers general topics such as the scope of the project/*Kaizen*, team, current situation, and problem identification, suggested implementation, implementation timeline, budget, and other resources overview as well as expected results after the implementation. The main difference usually is the volume of the documentation: for the *Kaizen* proposal, the form is short and precise. It mostly focuses on current situation analysis, identification of the waste, and expected results after the implementation. A project charter usually is a long and complex document.

For clarification purposes, in this thesis, the term *Kaizen* will be used as a project, which is carried out according to Lean methodology and using Lean tools.

1.2. Lean and *Kaizen*

Lean is a business management methodology that is becoming increasingly popular among manufacturing companies all around the world. It was first successfully adopted by Toyota in the 1940s and since the 1980s has become one of the most popular ways of functioning in the manufacturing world (Sohal and Egglestone, 1994).

Lean consists of different tools that all focus on a single goal: to reduce waste and optimize processes. Lean methodology identifies 8 distinct types of waste in manufacturing: defects, overproduction, excess processing, time-wasting, inventory, unnecessary motion, non – utilized talent, and transportation (Wickramasinghe and Wickramasinghe, 2017). Lean focuses on customer needs and how to reduce waste in the process that does not add any produce value for the customer. Lean implementation in the company makes the biggest impact on the employees, as they are required to change their mindset on how to approach the work. It is estimated that a company working according to Lean methodology should require only around 50% of resources (space, inventory, material, workers, etc.) to achieve the same customer need fulfillment, compared to the traditional (non-Lean) company (Seppala and Klemola, 2004). According to another study, Lean requires employees to be more agile, multiskilled, creative, and most importantly motivated to look for new ways of improvement (Kinnie, Hutchinson and Purcell, 1997). (Cheser, 1998) concluded his study that *Kaizen* implementation overall enriches the manufacturing environment in the company.

Kaizen in Japanese meaning, "continuous improvement" or in other sources "change for the better" is one of the most popular Lean tools (Manos, 2007). *Kaizen* was first described in Masaaki Imai's book "*Kaizen*: They Key to Japanese Competitive Advantage." The principle of *Kaizen* is simple: small improvements to processes by reducing wastes result in overall improved performance of the company. (Bortolotti, et al. 2018) identified *Kaizen* as a structured project performed by a multidisciplinary team to improve the targeted work area or process in each timeframe. *Kaizen* principle is simple yet very smart: by performing their everyday tasks employees all company employees can produce *Kaizen* ideas. These ideas usually are small and subtle changes, which result in long-lasting improvements. *Kaizen* ideas can be generated with help of another Lean tool called *Gemba* – which can be described as a "place where things happen" – in other words by observing processes and identifying what can be improved by *Kaizen* (Mann, 2009). It is worth mentioning that during *Gemba* a process, not the person who is performing it is observed and evaluated.

It should not be forgotten that Lean comes from Japanese working culture which is quite different from Western working cultures (Macpherson, et al. 2015) This should be considered before the company steps into Lean world. (Garcia - Alcaraz, Maldonado - Macias and Cortes – Robles, 2014) concluded that there have been many studies done on Lean and *Kaizen* benefits, however, we are still lacking knowledge of why so many companies fail to adapt to *Kaizen* philosophy. As (Manos, 2007) said: "*Kaizen* cannot just happen on its own, but must come from a company's thoughtful, serious commitment to continuous improvement. *Kaizen* events might last just a few days, but *Kaizen* does not happen overnight. It is a change in the way of thinking, not just a change in process".

According to (Chan and Tay, 2018) *Kaizen* is a continuous improvement (CI) that eliminates waste. This philosophy implies that small, incremental changes routinely applied and sustained over a long period result in significant improvements. The need for *Kaizen* arises when working to an existing work standard that does not meet the higher goals set. An improvement is when the improvement itself helps to influence the cause of the problem and the result of the problem is better to work safety, better quality, fewer defects, less remodeling, less waiting, less unnecessary movement, less consumption of raw materials, less downtime, no value-creating work. Do only as much as necessary, no more than less, and so on. The improvement is formalized by replacing the existing work standard. *Kaizen*, or rapid improvement processes, often is considered to be the "building block" of all lean production methods. *Kaizen* focuses on eliminating waste, improving productivity, and achieving sustained continual improvement in targeted activities and processes of an organization (Shang and Pheng 2013). The definition of Lean production in its adaptability has become a reality in our times (Loyd, Harris and Gholston, 2020). Most markets are mature, and customers demand quality products adapted to their specific needs (Hallgren and Olhager, 2009). Consequently, one would expect some degree of implementation of Lean Manufacturing (LM) practices in any sector with strong competition (Shan and Ward, 2003); (Vinodh and Joy, 2011).

Kaizen (Japanese for change, Zen for the benefit of all) has two main meanings. This can mean specific process improvements or large-scale process improvement activities. The *Kaizen* movement in Japan became widespread after World War II and is associated with the work of Edwards Deming and Joseph Juran in promoting and implementing Total Quality Management (TQM). *Kaizen* often takes the form of practical process improvement sessions. At *Kaizen* events, process optimization changes are being put into practice, involving employees at all levels. The term *Kaizen* Blitz is used to describe short, multi-day process improvement workshops, meaning quick improvements (Dellen, 2016).

Improvements are done by the PDCA cycle principle. PDCA cycle originates in Japan in 1950 and was formulated by Dr. W. Edwards Deming (in some sources also referred to as Deming cycle). The cycle consists of four stages: P – plan, D – do, C – check, and A – act. Throughout the years cycle was broadened and expanded to be used as a framework for improvement (Figure 1) (Moen and Norman, 2006). PDCA cycle sums up continuous improvement flow (Sokovic, Pavletic and Pipan, 2010). According to the authors, this improvement strategy is more successful and effective than *"the right-first-time"* approach.

Figure 1: The PDCA Cycle.

Source: Composed by the author

PDCA cycle is a very simple but systematic format, which has become a symbol for *Kaizen*. It allows simply to visualize and measure CI, as well as representing a link between CI and standard routine operations (Berger, 1997). According to (Awad and Shanshal, 2017), periodic follow-up events aim to ensure that the improvements from the *Kaizen* "blitz" are sustained over time. *Kaizen* can be used as an analytical method for implementing several other lean methods, including conversions to cellular manufacturing and just-in-time production systems. In *Kaizen*, it is important to follow a certain methodological discipline. It is defined by the famous Deming Circle (or PDCA), which means:

PLAN - Define improvement goals and plan for change;

DO - Implement improvements in practice;

CHECK - Evaluate progress and compare the achieved result with the set goals;

ACT / ADJUST - Eliminate discrepancies between real achievements and goals, standardize successful improvements.

These steps are repeated until the intended goal is reached.

Some LM studies have been based on samples of companies from different sectors (Cua, McKone and Schroader, 2001); (Shan and Ward, 2003); (Vinodh and Joy, 2011). Others have focused on a broad sample of firms from a few sectors, usually, the automobile, electronics, and machinery industries, although much of the research in these sectors consists of studies of isolated cases like one conducted by Power and Sohal (Power and Sohal, 2000). There is also some evidence of the successful implementation of LM in sectors such as construction (Pheng and Teo, 2003) and food processing (Dora, et al., 2013).

Therefore, various authors have considered it necessary to widen the range of industries in which LM is studied (Hallgren and Olhager, 2009); (Shan and Ward, 2003), especially taking into account that the development of LM began in discrete manufacturing and that its application in process industries has hardly been studied and almost always based on results obtained from only one case (Bonavia and Marin-Garcia, 2011).

Various tools of quality improvement such as *Kaizen*, poke-yoke, etc. to improve the leadership in process safety and teamwork. (Barraza-Suarez, Smith and Dahlgaard-Park, 2012), illustrated that three techniques namely 5S, *Gemba Kaizen* workshops, and process mapping which are related to Lean - *Kaizen* have a direct effect on the processes and management systems.

They stated that these techniques improved the processes and quality of public services. Singh and Singh, 2009 notified that sustaining results of a *Kaizen* event is difficult over time for many organizations. They identified the factors which prominently affect the sustainability of work area employee attitudes and commitment organization (Karim and Arif-Uz-Zaman, 2013) proposed a methodology that enables systematic identification of manufacturing wastes, selecting appropriate Lean tools, identifying relevant performance indicators, achieving significant performance improvement, and establishing a Lean culture within the organization (Suarez-Barraza, et al., 2011). Dibia, Dhakal, and Onuh, 2014 developed a social-technical model named Lean 'Leadership People Process Outcome' and measured benefits as waste elimination and process optimization that drive the industry towards continuous improvements.

Arya and Choudhary, 2015 notified that Lean approach-based practices improve production efficiency and product quality. Carmeli and Gittell, 2009 studied critical success factors for continuous improvement projects and concluded that there is not a clear and concise set of factors mentioned in the literature that affects the success of a continuous improvement program.

Within the present economical content, considering the importance of revenues, the management focus has been transferred from sale departments to the after-sales department, and cost reduction specific to this activity has become one of the tactic objectives of the organization. The implementation of the concept of continuous improvement involves:

- continuous improvement of product and process;
- periodical evaluation of the performance standards of excellence criteria previously set to identify the areas which need improvement;
- continuous improvement of productivity effectiveness and efficiency of all processes in the organization;
- promotion of prevention-based activity;
- education and instruction of each employee to be able to use the techniques of continuous improvement such as:
- innovation technique, the Deming cycle planning, do, check, act;
- the technique and instruments of quality management;
- process reengineering;

- process;
- setting the objectives concerning the improvement and the necessary measure to achieve them;
- recognition of the results obtained by the organization staff concerning the continuous improvement particularly speaking of processes.

Kaizen improvement of technological manufacturing, approach systematic steps to improve the technological process: process mapping, analyze the process and redesign the process. The life cycle is used to assess the environmental aspects and potential impacts associated with a product, process, or service. It involves making detailed measurements during the manufacture of the product, from the mining of the raw materials used in its production and distribution, through its use, possible re-use or recycling, and its eventual disposal process, the new trends of eco-age, must begin with a new design process of sustainable products.

Other ways to reduce wastes are:

- New, more efficient manufacturing technology development;
- Increased machine performance;
- Limit wasting in manufacturing by completing *Kaizen*;
- Increasing employees' performance;
- reduce consumption costs and increase productivity;
- reduce delivery time;
- increase flexibility in meeting customer requirements, etc.;
- improvements increase competitiveness in the market.

The examples on these pages are designed to help the people interested in how visual devices can benefit different aspects of a company's activity, how a company can improve productivity, profitability, customer satisfaction, and employee attitude. Also, it is easier and faster to train employees in a work area that is orderly and well-marked.

1.3. Employee involvement

Employee involvement has been widely researched; therefore, it could be described differently. Arti Chandani has described three types of employee engagement in the company: engaged (passionately working towards the company’s mission and goal achievement), not engaged (who participate unwillingly

and do not show passion towards goal achievement), and disengaged (employees who are not happy with their work and do not show any interest in achieving company's goals) (Chandani, Mehta, Mall, & Khokhar, 2016). According to another study, employee involvement is described as "the degree to which workers participate in making decisions about their jobs and working conditions" (Neirotti & Pesce, 2019). Every company tries to create the best possible environment to boost employee engagement level because it creates an emotional attachment between employees and the company. Engaged workers show more passion and enthusiasm performing their daily tasks, also are much more likely to go the extra mile beyond their contracted duties. The majority of previous studies regarding employee engagement agree that employee engagement positively impacts overall employee performance (Anitha, 2014), (Attridge, 2009), (Chandani, Mehta, Mall, & Khokhar, 2016).

The Lean implementation issues are regionally based on the country, geographic location of the country, and work environment of the organization (Barclay, Cudney, Shetty, & Anthony, 2021). The inadequate practices, disorganized structure, and communication gap result in several wastes within the organization which consequently makes the industry ineffective. So the elimination of waste and achieving zero defect in the processing are the main goals of LM which can be realized by distributing consciousness and understanding of Lean, recognizing Lean drivers, eradicating Lean barriers, developing teamwork by effective leadership, arranging crossfunctional teams, suggestion scheme, adopt innovations and efficient information, appreciation to workers by paying rewards, improving the system by applying Lean principles (Anand & Kodali, 2009); (Jasti & Kodali, 2014).

The application of appropriate tools and techniques, worker interactions, top management are the main factors before Lean implementation (Barclay, Cudney, Shetty, & Anthony, 2021). After the implementation of LM, the whole system and processes of the organization are reviewed to grab continuous improvement opportunities. In today's industrial world, however, Lean thinking is prolonged to waste elimination only (Loyd, Harris, & Gholston, 2020), the systematic procedure for applying Lean strategies is still absent. In addition, the selection of a proper Lean approach depends upon common decisions rather than logical explanations made by the organization (Karim & Arif-Uz-Zaman, 2013).

Lean knowledge and capability which offer continuous improvement through education and training to both managers and employees are critical to the success of Lean implementation (Netland, 2015), (Sraun & Singh, 2017). Large-sized firms use Lean practices more than small and medium-sized industries. A huge literature has reported that SMEs have failed to achieve the desired results after Lean implementation. From the literature, it is evident that a new methodology is required to identify and sustain improvement in products and processes in Indian SMEs that can majorly benefit to cost-saving/ reduction

with several others as improvement in productivity, product/ process quality, delivery, and safety. Thus the adoption of a novel strategy of Lean - *Kaizen* can help organizations to achieve competitive advantage and secure a bright future.

1.4. Benefits of employee involvement in *Kaizen*

Kaizen, no doubt is one of the most beneficial Lean tools for the company. As discussed earlier, the *Kaizen* is a continuous improvement tool. It allows the company to identify and reduce or even eliminate different types of waste and optimize processes. Out of 8 wastes, the most important for the company usually are defects, overproduction, transport, inventory, and extra processing. As described by Lean Enterprise Research center in 2004 for most manufacturing operations only 5% of all activities add value. 35% are necessary non-value-adding activities and around 60% of all activities do not add any value at all (Melton, 2005). Value usually is considered as "what customer pays for". For example, when a customer buys an apple at the supermarket, he pays for its taste, appearance, and size. However for an apple to show up at the supermarket, it first needs to be grown in the orchard and picked – these would be considered as value-adding activities, because during them the actual product is being made. Activities such as quality control, packaging, and transportation of the apples are activities that do not add value but are necessary. Without them, the product could not be sold. Non-value adding activity examples could be storing the apples in the warehouse, packing apples into large bags for storage and later re-packing to smaller bags for selling, transporting them from the orchard's warehouse to the supermarket's warehouse (rather than straight farm to table), etc. These activities do not add any value – the customer does not pay for them, therefore they are considered waste and should be reduced to a minimum. Reducing the number of defective products also results in saving money, resources and time – as all of these products cannot be sold. In most cases, it is not possible to completely eliminate all the waste, but it can be reduced significantly by analysis, observation, and continuous improvement implementation.

Waste reduction results in shorter, faster, and more dynamic production, which is well optimized. Such processes are easier to manage. Continuous improvement also allows the company to quickly adapt to changing markets or laws. On top of that companies with high involvement levels show turnover rates at 40% lower and revenue growth 2,5 times higher compared to companies with low employee engagement (Scott, McMulen, & Royal, 2010).

Involvement in *Kaizen* activities is beneficial to employees themselves. First and foremost, *Kaizen* allows workers to optimize work and make it easier and improve error-proofing. Employees mostly are impacted by wastes types of defects, waiting, non-utilized potential, and motion.

Defects usually are an expensive type of waste for both the company and the employee. Most defects happen due to human error. *Kaizen* can help first of all identify where and why most of these errors occur and guide the implementation of error-proofing tools, which would decrease the chances of human errors happening (Schneiderman, 1986).

Waisted time is a huge issue across all companies around the world. Time wasting is a type of waste, which is the easiest to notice and measure, needs simple and cheap implementations but makes a huge difference overall. Effectively utilized time by employees means increased productivity. It is important not to understand reducing time wasted should come not from employees working harder or faster (which will result in human errors and defects), but by process optimization. For example, an employee spends around 3 minutes every time they need to find the correct chemical in the chemical storage cabinet at the laboratory because the cabinet is not properly organized and all chemicals are put in random order. After *Kaizen* implementation, containers with chemicals were put in alphabetical order and using *Poka-Yoke* method. This reduced the time to find a needed chemical to just 1 minute. If the employee needs to find 5 different chemicals to make a solution, this implementation will save up to 10 minutes. Jimmerson et al described a pilot project carried out at Community Medical Center in Montana US in 2002. During this project, the *Kaizen* team set a goal to reduce the turnaround time of pathologists' reports in the anatomical lab of the Medical center. After analysis of the current situation, the team came up with implementations, which helped to reduce turnaround time from 5 to 2 days (Jimmerson, Weber and Sobek, 2005). This example shows that almost any process can be optimized.

Another benefit *Kaizen* participation brings to the employees is skill development. To participate in *Kaizen* employees should have some basic training and understanding of how the process works. *Kaizen* encourages all participants to solve problems, think outside of the box and come up with implementations. Also, as in the regular project, the *Kaizen* team can be made from people from different departments and roles within the company. This gives a good opportunity to better understand how processes in the company work, especially in other departments (Styhre, 2002). According to Styhre, involvement in *Kaizen* activities also empowers employees, allows them to feel more involved in the company and its improvement. On top of that, it helps to develop new relationships with colleagues, strengthens teamwork, and establishes overall better understanding and relationships between co-workers (Janjic, Todorovic, & Jonanovic, 2020).

According to another study, Lean requires employees to be more agile, multiskilled, creative, and most importantly motivated to look for new ways of improvement (Kinnie, et al. 2006). (Cheser, 1998) concluded his study that *Kaizen* implementation overall enriches the manufacturing environment in the company.

1.5. Company factors of employee involvement in *Kaizen*

Lean is becoming more popular all around the world and many different companies are trying to introduce it as their primary business methodology. However, the previous studies find that the degree of implementation success varies, and all companies face challenges in Lean introduction process. The main challenge the companies face is employee involvement: how to engage employees in Lean and how to maintain the prominent level of involvement. *Kaizen* is one of the most popular and widely used Lean tools. However, at the same time, it is the tool that requires the most training and experience to be used to the fullest. This makes *Kaizen* prone to creating low engagement problems in the company. Because success factors of employee involvement in *Kaizen* projects have not been in-depth researched, it is much more difficult for companies, that are facing similar challenges to identify which factors in their case are lacking and produce a response plan to fix it.

A review of the literature (Cappelli & Neumark, 2001) suggests that employee involvement is the main concept behind virtually all of the studies examining high-performance work systems and organizational performance. (Shafiee, et al. 2020) indicates that the majority of the authors would agree with the statement that employee involvement is a key element of LM. On the other hand, some studies have reported that employee involvement does not directly affect operational results, but it does help to implement LM – which has a direct relationship with the performance (Fullerton and McWatters, 2002).

Several of these studies have proposed that the successful implementation of different operation management philosophies, such as Total Quality Management (TQM) or Just-in-Time (JIT), would depend on simultaneously implementing high employee involvement practices (Alfalla, Garcia and Lopez 2012). On the other hand, several studies have explained an improvement in performance by suggesting a close relationship between LM, High Involvement Work Practices, and Human Resource Management (Bonavia and Marin-Garcia 2011); (Fullerton and Fawson 2003); (Hasle 2012).

In this way, the process of learning and capacity building of the participants is accelerated. It is very difficult, and sometimes impossible, to create such conditions in an existing company. The format of this training center is suitable for "transclusion" type office companies, which are dominated by repetitive but

less visible operations. In this format, you can see very well how the process can be improved by the people who work in it, and how the work of the team, the group leaders, needs to be improved so that their team members get involved in the process. Throughout the curriculum, we aim for participants to make up to 20 improvements in their workplaces and processes, measure the results of the process, record them on reporting boards, create obstacles to smooth work, address issues, and capture the impact of improvements made. Repetition of improvements allows for the development of improvement abilities, better skills, and faster learning to recognize the cause-and-effect relationship in the process (Liu, Asio, Cross, Glover, & Van Aken, 2015).

The application of *Kaizen* is guided by the following principles:

- *The principle of experience*: learning through experiments; simulated but real learning environment; theory follows practice.
- *The principle of error:* learning from your mistakes in the process; constructive interpretation of the errors made.
- *The principle of teamwork:* team learning; learning from the exchange of ideas (Bhasin & Found, 2020).

In previous studies, the main factors determining the level of employee involvement were studied and identified. A study by Carmeli and Gittell suggests that employee involvement depends on personal factors such as employee communication, development, and co-employee support (Carmeli & Gittell, 2009). Another study identifies some key organizational factors for employee engagement such as support and human resources use working conditions, working culture, and leadership (Attridge, 2009). These results correspond to the results of (Markos & Sridevi, 2010) who identified alignment with strategy, employee empowerment, promotion of teamwork and collaboration as well as support and recognition as important as the most important organizational factors. Seven factors for employee engagement were also identified in a study by Anitha in 2014 who proposed a scheme with factors as work environment, leadership, team and co-workers, training and career development, compensation, organizational policies, and workplace well-being. They have also found out that all seven factors as independent variables contribute to about 67% of employee engagement. An empirical study by Farris et al. suggests that both company-based and employee-based factors are determinants for *Kaizen* involvement. These findings were repeated by Doolen et al., 2008 empirical study using the same framework formulated by Farris, Van Aken, & Worley, 2009.

According to the study conducted by Chen, et al., 2020 employee involvement is operationalized through four related variables: empowerment, training, rewards, and communication. The effects are tested by recording management perceptions in a different industrial sector from those usually studied in previous research –manufacturers, a highly competitive and internationally successful sector. All these are significant except for awards; specifically, relationships were found between empowerment, training, communication.

On the other hand, several studies have explained an improvement in performance by suggesting a close relationship between LM, High Involvement Work Practices, and Human Resource Management (Bonavia & Marin-Garcia, 2011).

The study conducted by Erdogan & Bond, 2017 in the wood products industry in the U.S. also identified five main success factors for *Kaizen* implementation and employee involvement in these activities. Their identified factors were employee awareness, employee training, teamwork, quality control and planning, and productivity improvement.

The product life cycle becomes even shorter and is currently less than 5 years. There are a growing number of formats and models in an attempt to customize the goods offered, while producers attempt to reduce delivery times (Albors-Garrigos, Hervas-Oliver, & Marquez, 2008). Current trends indicate that this tendency most likely will increase in the future.

Lean is becoming more popular all around the world and many different companies are trying to introduce it as their primary business methodology. However, the previous studies find that the degree of implementation success varies, and all companies face challenges in the Lean introduction process. The main challenge the companies face is employee involvement: how to engage employees in Lean and how to maintain the prominent level of involvement. *Kaizen* is one of the most popular and widely used Lean tools. However, at the same time, it is the tool that requires the most training and experience to be used to the fullest. This makes *Kaizen* prone to creating low engagement problems in the company. Because success factors of employee involvement in *Kaizen* projects have not been in-depth researched, it is much more difficult for companies, that are facing similar challenges to identify which factors in their case are lacking and produce a response plan to fix it.

1.5.1. Communication

The first and the most important communication is to explain the purpose of why a company is using Lean methodology and that is the goal. An effective and thorough explanation of the purpose of why new methodology and tools are being implemented is the key to triggering an interest in employees, which

ideally will result in engagement. Especially Lean and *Kaizen* concepts are unique for employees who are used to standard working practices. Traditional or standard working practices that are used in Western business methodologies focus more on broad-scale innovations while *Kaizen*s in Lean system focuses on generating small improvements, which instantly reduce waste (Lucey, Bateman, & Hines, 2004). Employee awareness of company goals and why specific tools are being implemented was the key factor identified by (Erdogan & Bond, 2017). If employees understand what benefits Lean and *Kaizen* bring to the company and then they will be more enthusiastic to participate and embrace new methodology. Another study showed that goal clarity was one out of two most principal factors for employee attitude towards *Kaizen* and capabilities (Farris, et al. 2009), (Glover, et al. 2011).

Empowerment has been described as critical to successful Just-in-Time (JIT) initiation and implementation. It would seem clear that companies implementing a higher degree of LM practices need to have previously increased empowerment (Fullerton and McWatters, 2002). Empowerment can improve trust and communication between employers and employees (Khan, 1997). It also helps to endorse a commitment to company goals and encourages better relationships between colleagues while working on shared tasks and procedures. These ideas suggest the following idea by Marin-Garcia and Bonavia: "If employees receive suitable information and training, the workforce may develop share abilities and a better understanding of the processes in which they participate" (Marin-Garcia & Bonavia, 2015). For this reason, various studies have shown the link between LM and training (Marin-Garcia, Garcia-Sabater, & Bonovia, 2009), (Hiltrop, 1992).

Practices that encourage top-down communication (feedback, charts showing operational performance measurements, financial or strategic information) help employees to feel that their role in the company is important. LM seems to imply improved communications (Cua, McKone, & Schroader, 2001).

The longer company operates in Lean, the more opportunities for improvement it sees (Mann, 2009).

1.5.2. Training

Training is essential for any new activity or methodology that the company is introducing. Lean and *Kaizen* concepts are unique for employees who are used to standard working practices. A study conducted in Mexico by (Garcia J. L., Maldonado, Alvaro, & Rivera, 2014) found that the most crucial factor of employee involvement in *Kaizen* is training and management commitment. Another study in the

U.S. by Erdogan, Quesada-Pineda, and Bond in 2017 results showed training and as the second most key factor in *Kaizen* success.

Training is also directly connected with employee skills that are acquired or improved with training. Doolen, Worley, Van Aken, and Farris describe skills as: "psychomotor capabilities of the employee that are required, and attitudes refer to the requisite cognitive capabilities necessary to perform a job" (Doolen, Van Aken, Farris, Worley, & Huwe, 2008). Chafee, 1993 results suggest that skills arise from training, which should be provided by the organization. Employees with developed skills are also much more likely to be more fully engaged.

According to J. Kurilaitė (2015), Lean Academy Lithuania was the first in Lithuania to open a Lean learning center, where companies can practice Lean principles on a real assembly line. The learning center is mobile so it can easily come to any business. Learning Center programs are based on three learning principles: adults learn faster when they do the work themselves; learn faster when mistakes are made; when working in a team, our idea changes as the team dynamics take place.

Office processes are harder to see, employees have higher education and are more attached to the current situation as good enough. Employees are more sensitive to the learning process. And until they see the whole process of change and benefit the employees themselves, they become less involved. But when they notice how change is happening and what its benefits are, then they get involved in good faith. Based on this observation, and to involve more employees in the process of change more quickly, we have created a special training center to develop the skills of these employees to improve the process (Liu, et al. 2015).

Lean Academy Lithuania (hereinafter referred to as LAL) has developed a new Lean training format - Lean Academy - we have developed special simulators, in which Lean methodology is learned during the work itself. Such training centers exist only in Sweden, Italy, and Japan. This specially equipped training center is very close to the real work - a pedal-covered go-kart assembly line, which teaches how to recognize a work as a process and improve it during the go-kart assembly process. A very important emphasis in this training center is that while performing the work and improving it at the same time, skills are acquired to improve the processes, and there is no fear of making mistakes and experimenting. This work/education process is not a game or simulation that is often very far from reality. We have specially created a controlled work environment where the process can be stopped if it needs to be repeated to discuss certain details (Kurilaitė, 2015)

In this way, the process of learning and capacity building of the participants is accelerated. It is very difficult, and sometimes impossible, to create such conditions in an existing company. The format of this training center is suitable for "transclusion" type office companies, which are dominated by repetitive but

less visible operations. In this format, you can see very well how the process can be improved by the people who work in it, and how the work of the team, the group leaders, needs to be improved so that their team members get involved in the process. Throughout the curriculum, we aim for participants to make up to 20 improvements in their workplaces and processes, measure the results of the process, record them on reporting boards, create obstacles to smooth work, address issues, and capture the impact of improvements made. Repetition of improvements allows for the development of improvement abilities, better skills, and faster learning to recognize the cause-and-effect relationship in the process (Liu, Asio, Cross, Glover, & Van Aken, 2015).

1.5.4. Management

Supervisors and managers play a vital role in employee involvement. Management commitment has a strong positive effect on *Kaizen* implementation and communication (Garcia J. L., Maldonado, Alvaro, & Rivera, 2014). According to their study and findings in Mexico, support from senior management is the second most important factor for *Kaizen* implementation, following the commitment and motivation from the staff. In the study, leadership was evaluated as a separate factor and turned out to be also very important for *Kaizen* implementation (4^{th} place out of 21). Interestingly, the study found out that there are a lot of other factors, which usually are attributed to management, which also play key roles in *Kaizen* implementations such as resource allocation, setting goals for continuous improvement, assessment system, establishing policies and structures as well as clarification of goals and common ideas (Garcia J. L., Maldonado, Alvaro, & Rivera, 2014). Scott, et al suggests that managers should also be encouraged and rewarded for promoting engagement in the company activities of their peers (Scott, McMulen, & Royal, 2010).

A study conducted by (Alefari, Salonitis, and Xu, 2017) interviewed 48 representatives from various United Kingdom companies working according to Lean to find out more about leadership importance. The results showed that management (top and middle) was one critical factor for Lean success in all companies participating in the study. They also identified that management should be committed and involved in Lean on daily basis and act as role models.

In general studies about employee involvement and Lean show that it promotes employee empowerment. It means that employees have more power to make decisions themselves. According to Lean principles, all Lean activities in the company should be monitored by a dedicated Lean team. This allows managers to focus on the problem-solving, allocation of resources, and more effective team management, rather than spending their time figuring out how to make processes more smooth – this task now falls on

everyone in the team and company. Other Lean tools such as *Gemba* and *Asaichi* are used to monitor the processes daily (Zhang, Niu, & Liu, 2020). David Mann describes management in Lean as a "missing link". According to his study, management in Lean is a closed-loop system, which focuses on the process to drive improvement (Mann, 2009).

Gemba is the most powerful tool managers can use to support and monitor Lean as well as employee involvement in it. The main principle of *Gemba* is "a place where things happen" – in other words by observing processes and identifying what can be improved. *Gemba* is one of the main sources of *Kaizen* ideas. *Gemba* is beneficial in two ways: it allows managers to observe processes and identify the areas, where improvement might be useful or even necessary as well as to acquaint managers with processes in detail. (Mann, 2009).

Another tool used by management in Lean setup is *Asaichi*. *Asaichi* is a maximum of 15 minutes long daily meeting, which usually happens in the morning (Das & Verma, 2020). During this meeting, the most important aspects of the previous day are discussed. *Asaichi* has a special board, which is used to follow key figures for the company or team. It allows managers and team leaders to accurately follow all key figures and learn about any issues or challenges that happen. Every structural unit in the company usually has *Asaichi* every day. Large companies usually have several tiers of *Asaichi* meetings every morning, for example, fice tier *Asaichi* would look like this: tier 1 - team *Asaichi*, tier 2 - unit *Asaichi*, tier 3 - department *Asaichi*, and tier 5 - executives *Asaichi*. This system ensures a very quick and condensed stream of information from all levels of operations within the company to top management. As a result, most problems can be identified very early – the company is more swift and alert.

1.5.5. Process control

An empirical study conducted by (Glover, Farris, Van Aken, and Doolen, 2011) found out that performance review events, for example, key performance index (KPI) measurement, audits, and involvement in higher-level management boosted positive employee attitude towards *Kaizen*. Interestingly (Farris, Van Aken, Doolen, and Worley, 2009) results showed no significant relationship with process control being a critical success factor in *Kaizen*. However, they recommend organizations to keep strong and visible management support during the *Kaizen*, as it proved to be an important factor for success which correlates with results of (Glover, Farris, Van Aken, and Doolen, 2011). Erdogan, Quesada-Pineda, and Bond, 2017 study defined process control as usage of different quality control tools like "Cause and effect diagrams, scatter diagrams, Pareto analyses, quality circles", which provide essential information on current

process state and state after *Kaizen* was implemented, to check if *Kaizen* worked as expected. Manos, 2007 also concludes the importance of process control and monitoring. He believes that the standardized and controlled process of *Kaizen* should bring results, calculated at the beginning of the event and if it does not happen – then the process and the system should be looked at and lessons learned formulated (Manos, 2007).

The basic strategy by which a control system operates is logical and natural. The same strategy is employed in living organisms to maintain temperature, fluid flow rate, and a host of other biological functions. This is natural process control. The technology of artificial control was first developed using a human as an integral part of the control action. When we learned how to use machines, electronics, and computers to replace human function, the term automatic control came into use.

To provide a practical, working description of process control, it is useful to describe the elements and operations involved in more generic terms. Such a description should be independent of a particular application (such as the example presented in the previous section) and thus apply to all control situations. A model may be constructed using blocks to represent each distinctive element. The characteristics of control operation then may be developed from a consideration of the properties and interfacing of these elements. Numerous models have been employed in the history of process-control description; we will use one that seems most appropriate for a description of the modern and developing technology of process control.

Lean is very often mischaracterized as being focused only on cost reduction (Mann, 2009). Cost reduction is only one of many benefits Lean brings for the company. Lean should be considered as a management tool, which focuses on controlling the process to reach a point, where value is delivered with zero non-value-adding activities involved (Wickramasinghe & Wickramasinghe, 2017).

1.5.6. Reward system

When thinking about reward systems for everything, including involvement, money is the usual first choice. However, employees can be and should be rewarded in many more diverse ways, not only financially.

A study by (Scott and McMullen, 2010) analyzed questionnaire responses from 736 representatives of companies from different fields and countries all around the world about rewarding employees' involvement in the company. 60% of respondents indicated that they do reward employee engagement. Results also suggested that companies should not focus only on financial rewards for employee involvement

but should also consider other options for example team buildings, social events, work-life balance opportunities, or carrier opportunities (Scott and McMullen, 2010).

After a company has designed and implemented a systematic performance appraisal system and provided adequate feedback to employees, the next step is to consider how to tie available corporate rewards to the outcomes of the appraisal. Behavioral research consistently demonstrates that performance levels are highest when rewards are contingent upon performance. Thus, in this section, five aspects of reward systems in organizations are described: (1) functions served by reward systems, (2) bases for reward distribution, (3) intrinsic versus extrinsic rewards, (4) the relationship between money and motivation and, finally, (5) pay secrecy. Reward systems in organizations are used for a variety of reasons. It is generally agreed that reward systems influence the following:

- **Job effort and performance.** Following expectancy theory, employees' effort and performance would be expected to increase when they felt that rewards were contingent upon good performance. Hence, reward systems serve a very basic motivational function.
- **Attendance and retention.** Reward systems have also been shown to influence an employee's decision to come to work or to remain with the organization. This was discussed in the previous chapter.
- **Employee commitment to the organization.** It has been found that reward systems in no small way influence employee commitment to the organization, primarily through the exchange process. Employees develop ties with organizations when they perceive that the organization is interested in their welfare and willing to protect their interests. To the extent that employee needs and goals are met by the company, we would expect commitment to increase.
- **Job satisfaction**. Job satisfaction has also been shown to be related to rewards, as discussed in the previous chapter. Edward E. Lawler, a well-known researcher on employee compensation, has identified four conclusions concerning the relationship between rewards and satisfaction: (1) satisfaction with a reward is a function of both how much is received and how much the individual feels should have been received; (2) satisfaction is influenced by comparisons with what happens to others, especially one's coworkers; (3) people differ concerning the rewards they value; and (4) some rewards are satisfying because they lead to other rewards.
- **Occupational and organizational choice.** Finally, the selection of occupation by an individual, as well as the decision to join a particular organization within that occupation, are influenced by the rewards that are thought to be available in the occupation or organization. To prove this, simply

look at the classified section of your local newspaper and notice how many jobs highlight beginning salaries.

Scott, et al suggests that managers should also be encouraged and rewarded for promoting engagement in the company activities of their peers (Scott, McMulen, & Royal, 2010). After all, managers are also employees, who should be motivated and inspired to get involved to inspire others.

1.6. Personal factors of employee involvement in *Kaizen*

1.6.1. Motivation

Motivation, in general, is hard to measure or quantify, because levels of motivation depend on many different factors. However, none could argue that motivation is one of the key elements of any activity we do. Motivation, as a factor is interesting because it has a very close relation and dependency on the other factors such as support from the management, reward system, and co-workers attitude, as well as personal factors such as emotions, health, plans, and attitude.

One of the most attractive aspects of Lean for employees is acceptance of the mistakes and learning from them. Being afraid of making a mistake is an important aspect that demotivates employees. Mistakes or defects are an important part of Lean because they are the best indicators of where and what kind of *Kaizen* should be implemented to reduce and eventually eliminate chances for mistakes to happen. Lean attitude is that mistakes happen due to the process, not the operator. If the process is the most effective and lean – it will be performed flawlessly (Angelis & Fernandes, 2012), (Anitha, 2014), (Mann, 2009).

An empirical study conducted by Faris et al. found out that some studies show that Lean implementation in a company can act as a big demotivator. The main reason – Lean needs a lot of attention and effort, which might feel overbearing, especially if the employees are new to this methodology (Farris J. A., Van Aken, Doolen, & Worley, 2009). However, other researchers found that Lean can have a positive impact on the employees and their motivation. *Kaizen* is considered one of the most employee empowering Lean tools. It allows employees to get actively involved in the company and its processes, as well as make a difference for their good by improving working conditions, simplifying processes, and reducing chances to make errors. All these aspects boost motivation in employees to get involved (Farris J. A., Van Aken, Doolen, & Worley, 2009). Enabling employees to get involved, express their ideas, and use skills proves to be beneficial for both the employees and the company.

Garcia, Maldonado, Alvarado, and Rivera's study results show that *Kaizen* implementation improved overall improved attitude and competence of staff as well as their motivation and self-esteem (Garcia J. L., Maldonado, Alvaro, & Rivera, 2014). Cheser's, 1998 results are similar adding that *Kaizen* method makes employees' daily work more challenging but increases their drive to achieve goals. Both studies conclude that motivation is essential for workers to be involved in *Kaizen*. These results are also supported by (Farris J. A., Van Aken, Doolen, & Worley, 2009) findings.

Another interesting phenomenon called Organizational citizenship behavior (OCB) is also closely related to motivation. OCB can be described as an employee's voluntary commitment to an organization that is not part of his or her contracted tasks. OCB develops with time and is directly connected to motivation. First motivation drives the development of OCB, which later motivates for employees to be more involved and devoted to the company. A study conducted by (Cappelli & Rogovsky, 1998) showed that in Lean manufacturing company OCB is related to employee involvement and can improve individual performance.

1.6.2. Co-worker's support

Co-workers' support and teamwork are particularly important in every company. One of the most unique aspects of *Kaizen* is that teamwork in Lean/*Kaizen* setup is very similar to ones in projects. The team which is involved in a project in most cases consists of specialists from distinct roles or departments within the company. Another interesting aspect is that *Kaizen* team can consist of specialists from various levels of the company: high-level managers work with specialists, which helps build relationships and prevents separation between regular workers and high-level managers (Caliskan, 2016). In his study, Caliskan also identifies that encouragement and recognition of teamwork should be communicated and endorsed by the management. It was also proved that participation in *Kaizen* activities increases levels of enthusiasm, willingness, and comfort working with other colleagues (Bortolotti, et al., 2018).

Teamwork and the support of co-workers are critical in *Kaizen* because it is a team project. As a team, they have to find solutions using various tools such as SWOT analysis and "5-WHY", conduct evaluations and measurements of waste and savings (Desta, Asgedom, Gebresas, & Asheber, 2014).

Manos, 2007 claims that employees are more willing to ask for help from employees from the different departments if they have previously worked with them on a *Kaizen* together. These employees also show more enthusiasm and willingness to contribute, which embraces Lean culture in the company (Manos, 2007). Research by (Erdogan, Quesada-Pineda, and Bond, 2017) identified teamwork as the third

out of five most crucial factors for *Kaizen* implementation and success in the companies they were researching with. The same results were observed by (Andrew and Sofianb, 2012) stating that co-workers' support plays a significant role in involvement and employees, who received support from their colleagues are more likely to show higher involvement in the future. They also tend to show a more positive attitude, overall behavior and have better relationships with their co-workers and management.

A study conducted by (Cappelli and Rogovsky, 1998) showed that in Lean manufacturing company OCB is related to employee involvement and can improve individual performance. Employees take an example not only from managers but their co-workers as well. Establishing *Kaizen* as a fun, interactive way to promote teamwork, build new relationships, and solve problems leads to higher involvement in these activities.

2. RESEARCH METHODOLOGY

2.1. Research model, aim, and objectives

Lean is becoming an increasingly popular business management system. As many companies are implementing Lean, they face several challenges. With *Kaizen* being one of the most popular but also most training and experience demanding tools, companies often experience low employee involvement and engagement in this activity. Therefore, it is crucial to better understand that are the main factors of successful employee involvement in *Kaizen* projects. For companies, this information can be critical to understand underlying causes and develop effective response plans.

The research will be carried out following the framework (Figure 2), that was formulated after the literature review. Eight main factors of employee involvement in *Kaizen* projects were identified and split between company factors and employee factors. A quantitative research model was chosen to conduct this study.

The research aim is to identify factors of employee involvement in *Kaizen* in a Lithuanian manufacturing company.

Research Objectives:

1. To determine company factors of employee involvement in *Kaizen*.
2. To determine employee factors of their involvement in *Kaizen*.
3. To determine the benefits of employee involvement in *Kaizen* to the company.
4. To determine the benefits of the involvement in *Kaizen* projects for employees.

Factors have been split into company-based factors and personal-based factors. The following framework for the study was formulated (Figure 2). Some potential benefits that may come from employee engagement in *Kaizen* were also identified and included in the framework.

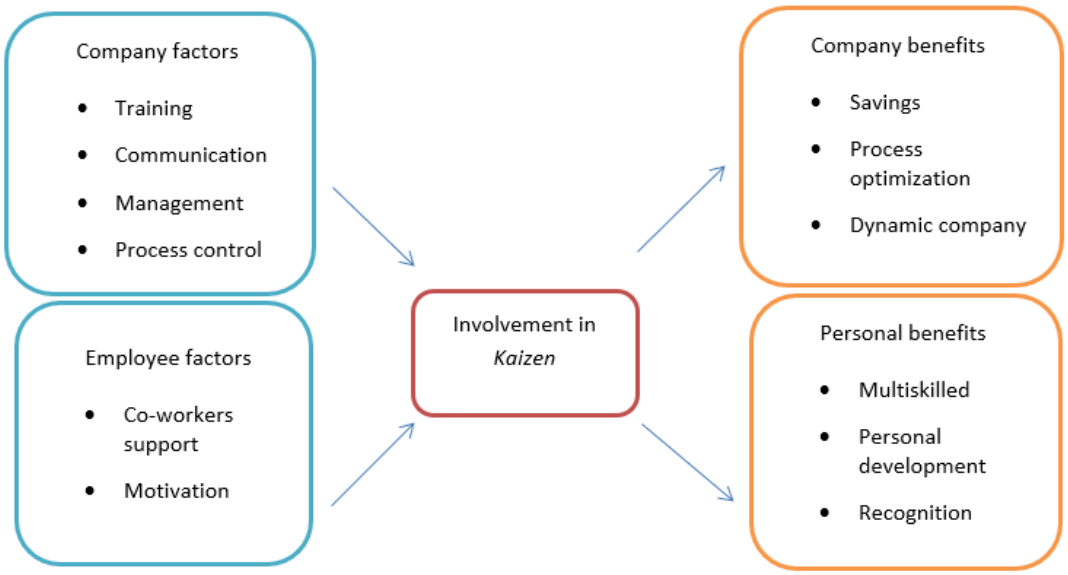

Figure 2: Framework of the study

Source: Composed by author

A quantitative research model was chosen for this study because it focuses on understanding general principles of the phenomena, testing the theory behind it, and measuring the extent of it. It works as a primary data collection tool (Johnson & Onwuegbuzie, 2004). The quantitative model focuses greatly on participants of the phenomena and results are based on their experience, knowledge, opinion, and interpretation. The main purpose of this study model is to determine the extent cause of the phenomena (Johnson & Onwuegbuzie, 2004). Collected complex data can later be analyzed using different statistical scientific tools to determine the trends, correlations, and dependencies between variables. Surveys and questionnaires are the most popular ways to conduct quantitative research.

The choice to use questionnaires rather than another data gathering technique such as interviews was done for several reasons. Firstly, using such a quantitative method aggregating survey data helps to ensure the anonymity of the participants and the confidentiality of data (Mitchell & Jolley, 2004). Secondly, questionnaires are also easy to distribute and are more cost-effective than other methods such as interviews.

The study used a quantitative research method as the research objective was known in advance of the data collection and all aspects of the study were designed before the data was collected. This is important as quantitative research is usually deductive meaning the study is testing theory rather than generating it like qualitative research would do (Weber, Schek, & & Blott, 1998).

2.2. Research method

The study used a quantitative research method as the research objective was known in advance of the data collection and all aspects of the study were designed before the data was collected. This is important as quantitative research is usually deductive meaning the study is testing theory rather than generating it like qualitative research would do (Weber, Schek, & & Blott, 1998).

Quantitative data would also be more useful in testing the hypotheses of the research and the results would be able to be better generalized and used to make predictions.

Some of the advantages of using a quantitative method are outlined above but in addition to these, using a quantitative method allows the researcher to arrive at more objective conclusions than qualitative methods may allow. It also helps to achieve high levels of reliability of gathered data and the questionnaire can get a lot of information from a large number of people in a short period (Osborne, 2008).

The limitations of this method include the fact that questionnaires can result in a low return rate and due to the researcher and the respondent not interacting, problems with the questionnaire cannot be corrected or answered (Mitchell & Jolley, 2004). A quantitative method also means that the outcomes can be limited to those outlined in the research proposal due to the structured format (Osborne, 2008). However, for the current research, this method of data collection was deemed the most appropriate.

2.3. Data gathering method

In this research case, an anonymous questionnaire was used. The questionnaire was universal – all employees of the company were invited and given an opportunity to participate in the research. The questionnaire was prepared in the Lithuanian language, as all employees working at the company understand this language. A questionnaire was sent to all employees by email, employees who do not have access to computer and work email were given printed versions of the same questionnaire. Results from the hand–filled questionnaires were manually added to the system by the research author, ensuring confidentiality and data transparency.

The questionnaire consisted of twenty-four questions in total. Nineteen questions were multiple-choice, where participants were able had to choose one or multiple answers (four of these questions were demographic). Three questions were matrixes with Likert scale. Participants were given statements and asked to evaluate how true these statements are to them. At the end of the questionnaire, there were two

open questions, where participants were asked to answer the question in their own words. These last two questions were not mandatory to answer.

Breakdown of the questionnaire:

- Questions 1 to 4 – demographic (participant age, gender, education, and position in the company);
- Questions 5 to 8 – general questions about experience with Lean and *Kaizen;*
- Questions 9 to 13 – questions about the various company and personal factors for employee involvement in *Kaizen* proposals;
- Questions 13 to 18 – about process control;
- Question 20 (Likert scale) – about training;
- Question 21 and 22 (Likert scale) – about motivation, reward system, and management;
- Question 23 (open, non - mandatory) – "In your own words please describe the main drawbacks of the current *Kaizen* proposal process. Please give suggestions on how can these drawbacks be fixed.";
- Question 24 (open, non - mandatory) – "Please share any other observations or suggestions you have regarding the current *Kaizen* proposal process".

All company and personal factors identified in Figure 1 were covered in the questionnaire.

2.4. Research background and scope

For this study, a manufacturing company in Lithuania, which follows Lean methodology was chosen. The company was established in 1994 and it specializes in manufacturing and printing packaging and labeling elements. Currently, this company is the largest packaging and labeling manufacturer in the Baltic states. The main sustainability objectives of the company are economic (value for the stakeholders, satisfying customers' needs, promoting innovation), environmental (efficient resources and waste management, eco-friendliness, being a role model for the partners), and social (ensuring a healthy and safe working environment for the employees, maintaining an open relationship with the community). The

company also operates following ISO 9001 standard for quality assurance, ISO 14001 standard for environmental protection, The BRC standard for quality and safety of packaging products coming into direct contact with food, and FSC standard to guarantee that raw materials come from ethically sourced timber from forests in which ecological balance is maintained through reforestation.

Company values and a strong focus on quality and innovation led to Lean business methodology implementation in 2017. Lean was chosen because it was developed specifically for manufacturing companies and they benefit the most from this business framework. Since 2017 company has embraced Lean by implementing various Lean tools, one of them being *Kaizen*. The company currently has around 200 employees. The company consists of three departments: administration, engineering, and manufacturing. All employees go through Lean learning workshop. The main purpose of this course is to introduce employees to the principles and benefits of Lean, explain what tools are used for which purpose. Employees also participate in practical training, where they learn how to correctly use different Lean tools. *Kaizen* is one of the key Lean tools for the company, due to the benefits it can bring to the overall benefits it can bring to the company and the employees. All projects taking place in the company are considered *Kaizen*s and follow the standard *Kaizen* implementation framework shown in Figure 3.

Figure 3: Kaizen implementation framework

Source: composed by the author

First of all, a waste or new idea must be identified and the *Kaizen* proposal form is filled. All proposals are reviewed by a designated board, which includes: Improvement and Lean manager, finance manager, human resources manager, and IT manager, etc. Large value and scope *Kaizen* projects must also be reviewed and approved by the department manager and/or operational manager. The proposal can be either approved, rejected, or returned to the owner for improvements if the proposal is missing information or data. Approved proposals become *Kaizen* projects implementation process begins. Proposals can be rejected due to various reasons, but most often because the company does not have the resources to implement the idea or because the implementation payoff is too small.

Employees of all departments are expected and encouraged to participate in various Lean activities, especially in *Kaizen*, because this tool seems to have the lowest involvement and participation rates. The

company calculates employee involvement in *Kaizen* projects by the number of submitted and approved proposals per year.

Since Lean implementation in 2017 company has set a goal that a minimum of 60% of all employees should submit and get approval for at least one *Kaizen* proposal per year.

Participation data are summarized in Table 1 and Table 2.

2018	**Administration department**	**Engineering department**	**Manufacturing department**	**Total**
Employees	22	39	141	**228**
The goal of approved *Kaizen* proposals per year	44	78	282	**456**
***Kaizen* proposals approved per year**	38	14	89	**146**
Involvement	86%	18%	32%	**32%**

Table 1: *Kaizen* involvement data summary for 2018.

Source: data provided by the company, composed by the author.

2019	**Administration department**	**Engineering department**	**Manufacturing department**	**Total**
Employees	22	39	141	**228**
The goal of approved *Kaizen* proposals per year	44	78	282	**456**
***Kaizen* proposals approved per year**	31	18	66	**122**
Involvement	70%	23%	23%	**27%**

Table 2: Kaizen involvement data summary for 2019.

Source: data provided by the company, composed by the author.

Data in Tables 1 and 2 indicate, that on average the *Kaizen* involvement was only 30% and is just half of the set goal figure. It also shows a huge discrepancy between employees' involvement from different departments. The administration department has significantly higher participation compared to other departments. This data is concerning because Lean tools were created for manufacturing and this is where they should be embraced the most.

2.5. Research sample

To begin with, the results of the study were aimed at determining the demographics of the respondents. Results are summarized in Table 3.

Question	***Answer options***	***Number of respondents***	***Percent of respondents***
Gender	Man	71	70,3
	Woman	30	29,7
Age	up to 25 years	9	8,9
	26 – 35 years	38	37,6
	36 – 50 years	36	35,6
	50 and over years	18	17,8
Education	Secondary	26	25,7
	Professional	10	9,9
	Higher non-university	21	20,8
	Higher	44	43,6
Position held	Manufacturing worker	35	34,7
	Office worker	48	47,5
	Head	13	12,9
	Other	5	5,0

Table 3: Demographic data of the respondents.

Source: composed by the author.

During the evaluation of the results of the survey, it was found that the majority of respondents were men (70,3%), and less than a third of women (29,7%). Considering that this is a manufacturing company in the printing packaging and labeling elements field, it was expected that the majority of the respondents will be men. After the distribution of respondents by age groups, the majority of respondents indicated that they belong to the age group under 25 years (8,9%), slightly more than a third of respondents indicated that they belong to the age groups from 26 to 35 years (37,6%), 36 to 50 years (35,6%), and slightly less than a quarter of respondents indicated that they belong to the age group 50 and over (17,8%). Assessing the distribution of respondents education, the majority of respondents indicated that they have acquired higher education (43,6%), slightly more than a quarter of respondents indicated that they have acquired secondary education (25,7%), higher non-university education (20,8%), and only a few respondents indicated that they have acquired vocational education (9,9%). According to the distribution of respondents according to their position at the company, the majority of respondents indicated that they hold office positions (47,5%), slightly more than a third of respondents hold production positions (34,7%), and slightly less than a quarter indicated that they hold the position of the head (12,9%). Several respondents marked their current position as other.

3. RESEARCH RESULTS

3.1. Data review

After assessing the distribution of respondents according to whether they had submitted at least one *Kaizen* proposal since starting work in the company, in addition to what was written during *Kaizen* training, the majority of respondents indicated that they had submitted at least one *Kaizen* offer since starting work (66,3%), and slightly more than a third of respondents indicated that they have not proposed any *Kaizen* project ideas since they started working in the company. (33,7%) (Figure 4).

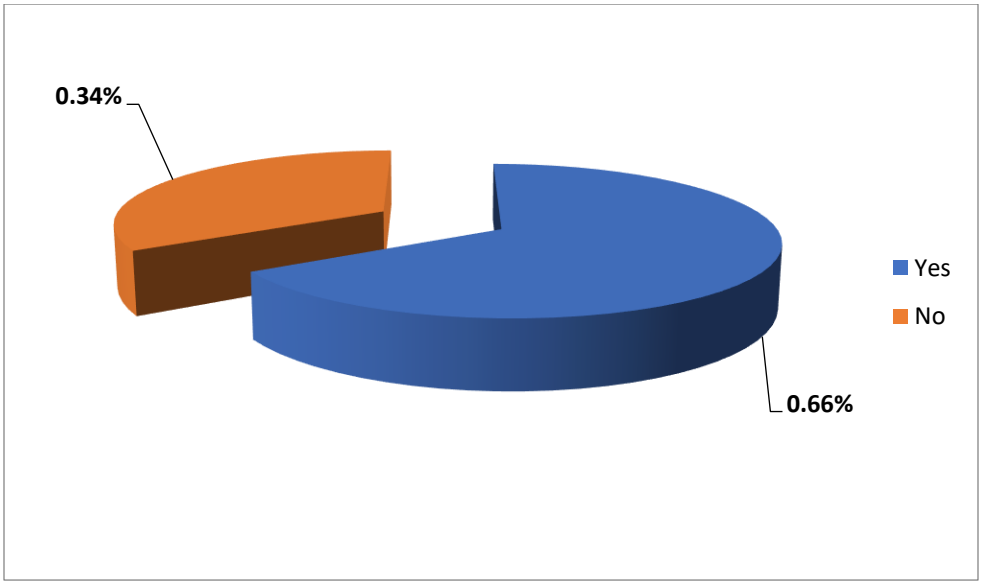

Figure 4: Distribution of respondents according to whether they had submitted at least one *Kaizen* offer since starting work at the company, apart from what was written during the *Kaizen* training.

Source: composed by the author

Assessing the distribution of respondents' opinions in terms of the average number of *Kaizen* proposals submitted per year, more than a third of respondents indicated that they submitted an average of 2 to 5 *Kaizen* proposals (35,6%) and one *Kaizen* proposal (33,7%), slightly less than a third of respondents indicated that they had submitted 6 or more *Kaizen* proposals (26,7%), and only a few respondents indicated that they had not submitted any *Kaizen* proposals during the year at all (4%) (Figure 5).

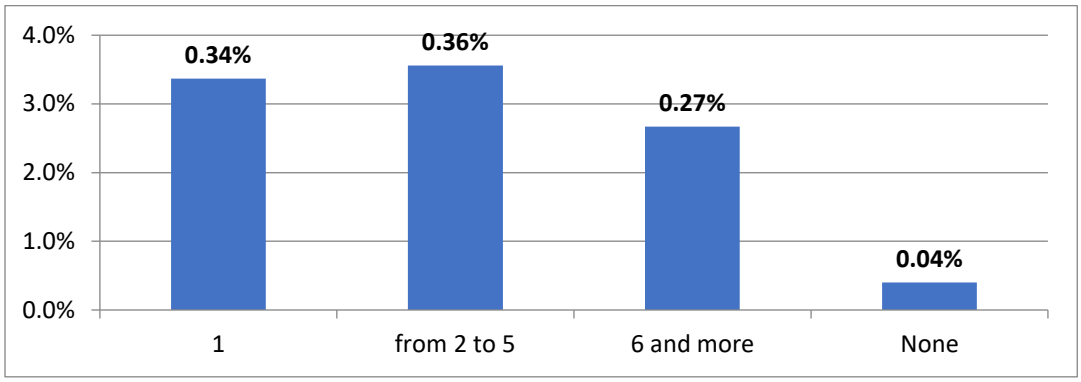

Figure 5: Distribution of respondents opinions in terms of the average number of *Kaizen* proposals submitted per year

Source: composed by the author

The reasons for and why employees did not make any *Kaizen* proposals were as follows: the majority of respondents said they had no ideas which could be converted into *Kaizen* (20,8%). A few people said they did not have time to submit the *Kaizen* proposal (5,9%). 4% of participants did not understand the application process, while 2% were not sure how to fill the proposal form correctly. Only 1% of respondents indicated that they do not know what the *Kaizen* proposal was. 3% choose "other" as the main reason why they did not participate in *Kaizen* proposals. (Figure 6).

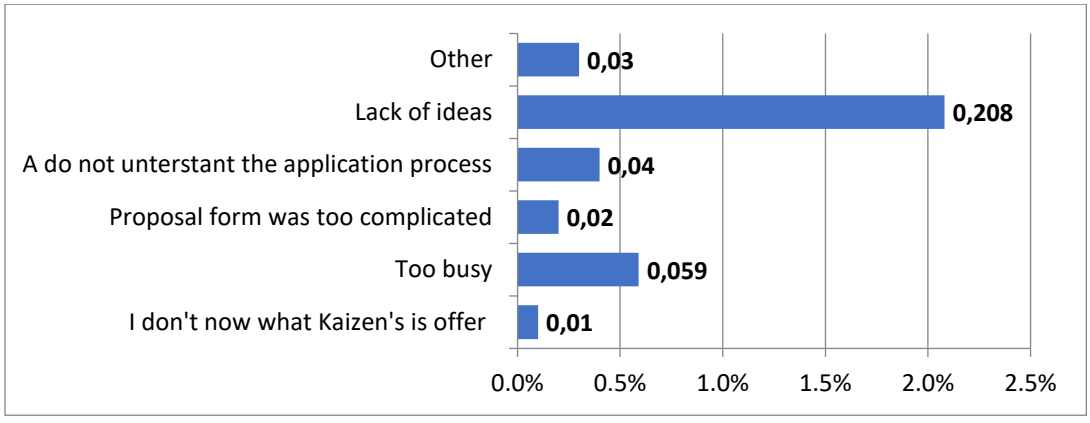

Figure 6: Distribution of respondents' views on the reasons why they do not make *Kaizen* proposals.

Source: composed by the author

Assessing the distribution of respondents' previous experience with the Lean methodology before they started working at company X, the majority of respondents indicated that they were not familiar with Lean methodology at all (73,20%), while more than a quarter of respondents indicated that they were aware of the Lean methodology but did not actively practice it (21,80%). Only 5,90% of respondents indicated that they knew about Lean methodology and were actively practicing it at their previous job. (Figure 7).

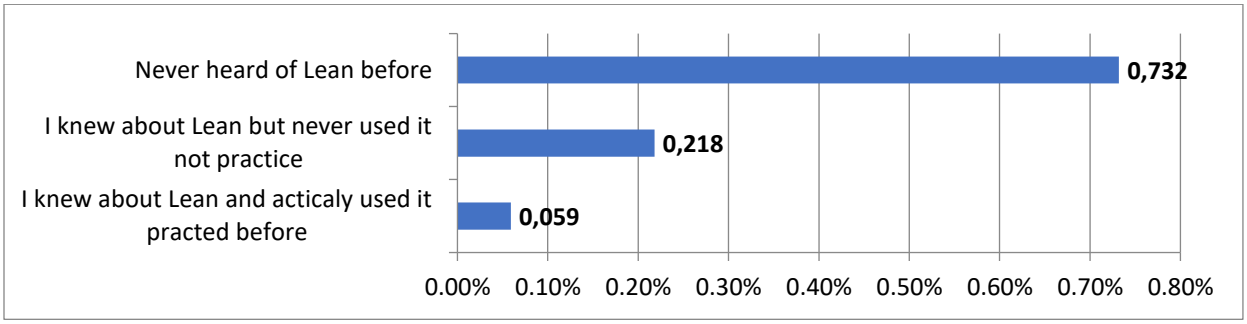

Figure 7: Distribution of respondents' opinions on whether they had encountered the Lean methodology before starting work in company X.

Source: composed by the author

Following the distribution of respondents' views on the main purpose of *Kaizen* proposals, respondents were asked to choose between several answers, and the majority of respondents noted that *Kaizen*'s proposal was aimed at improving processes, results, the environment, and working conditions (88,1%). More than half of the respondents stated that *Kaizen* proposals encouraged employees to show initiative (50,5%), while less than a third of respondents indicated the need to improve employee teamwork (26,7%). 20,8% of survey participants thought that *Kaizen* proposals help employees to improve their professional skills. Only 5% of respondents indicated they never thought about it (Figure 8).

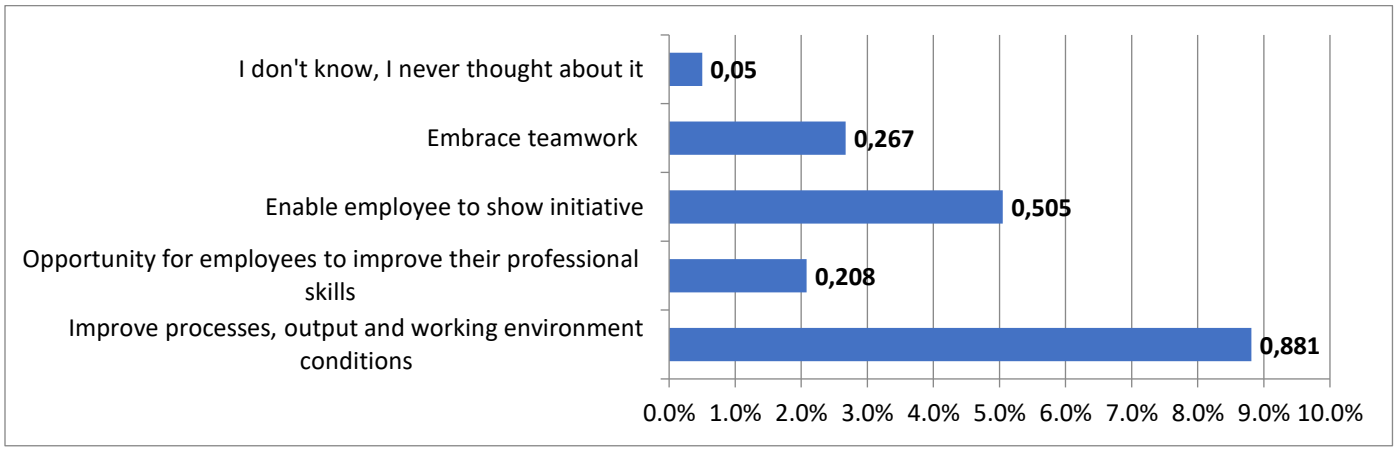

Figure 8: Distribution of respondents' views on the main purpose of *Kaizen* proposals.

Source: composed by the author

Approved *Kaizen* proposal owners are awarded gift vouchers. As indicated in Figure 9 majority of respondents knew about it (98%) and only a few respondents did not (2%).

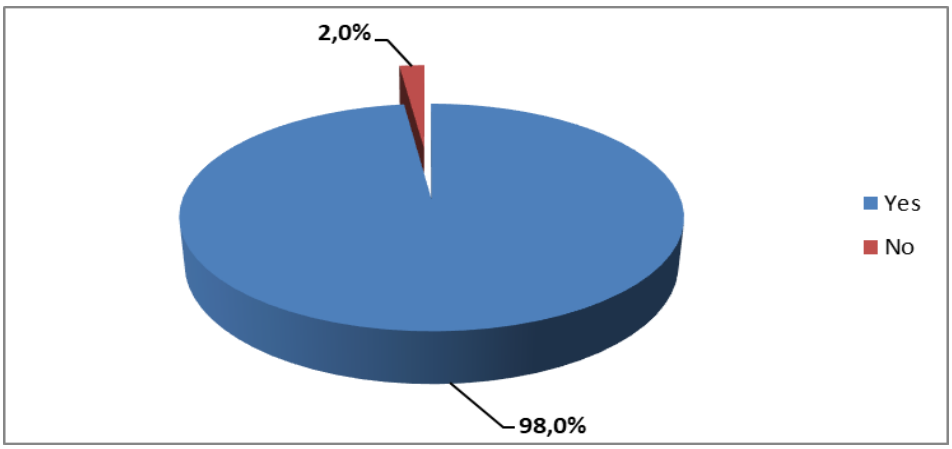

Figure 9. Assessment of respondents' knowledge that approved *Kaizen* proposal is awarded gift vouchers.

Source: composed by the author

Following the previous question, participants were asked if the current award system with gift vouchers is a good motivator for completing *Kaizen* proposals, around half of the respondents indicated that this is not the main reason for submitting proposals, but they liked winning a prize for it (42,6%). Only

5,9% of participants expressed that current gift vouchers give them a lot of motivation for submitting *Kaizen* proposals. 30,7% indicated that they do not care about any prizes or motivational measures and it did not motive them to submit proposals. 20,8% of respondents said that did not like the current award system, but if it was more rewarding or rewards were different, it would motivate them to be more actively involved in *Kaizen* (Figure 10).

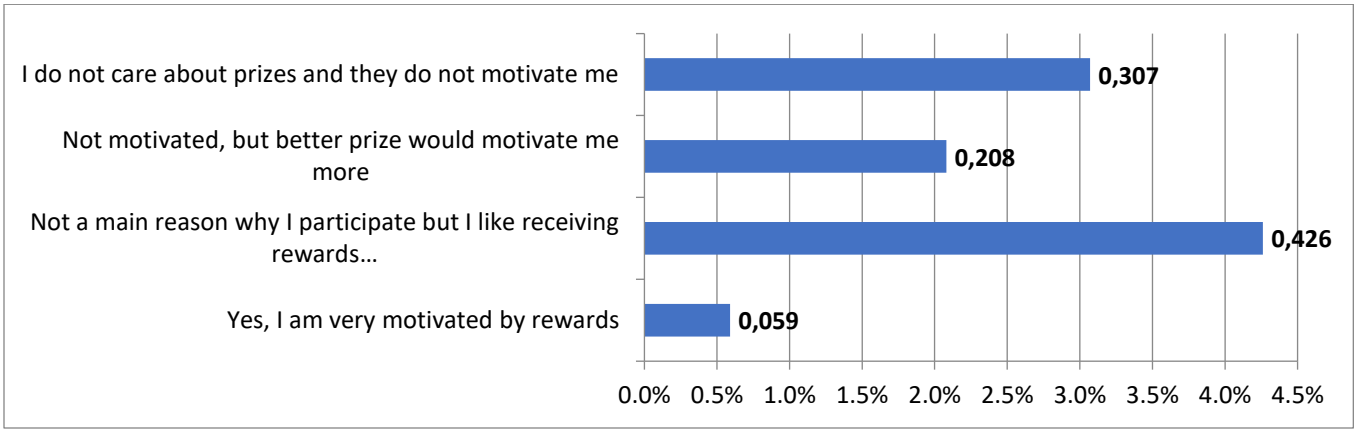

Figure 10: Distribution of respondents' views on whether the current points system and gift vouchers are a good motivator for completing *Kaizen* proposals.

Source: composed by the author

Participants were asked to choose which of the following factors would encourage them to submit *Kaizen* proposals more actively, results are shown in Figure 11 (multiple selections were permitted). Almost half of the respondents (40,6%) indicated that adjusting the workload to allow spending more time on *Kaizen* proposals would motivate them the most to get more involved. 35,6% expressed that a more appealing motivational system for successful *Kaizen* proposals would also boost motivation. Support from the manager also seemed to be important for employee motivation (20,80%). Other options such as more training, peer support, and other unspecified factors were had similar figures from 16,7% to 12,90%.

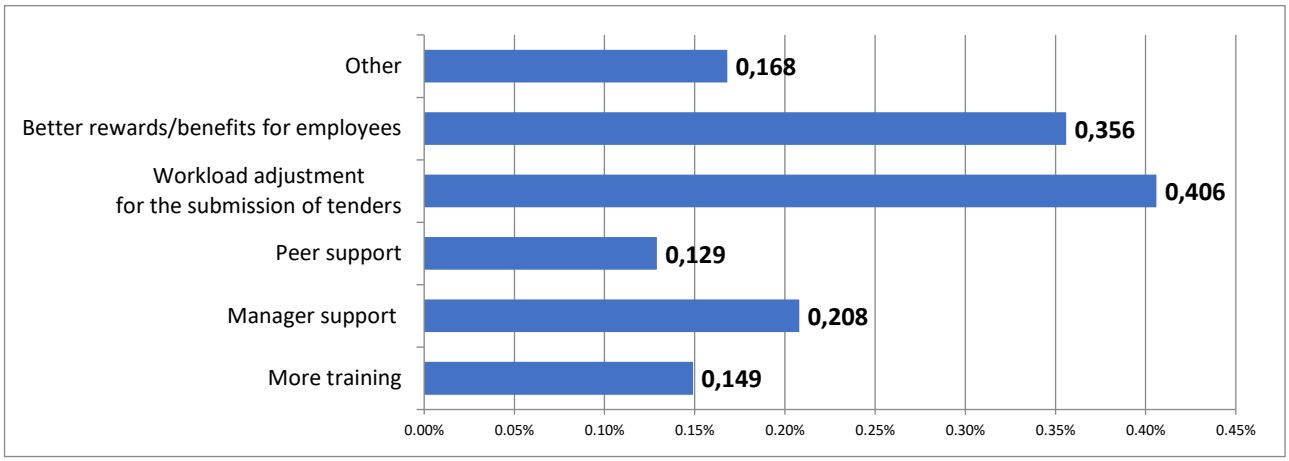

Figure 11: Distribution of respondents' opinions in terms of what would encourage them to submit *Kaizen* proposals more actively.

Source: composed by the author

Every *Kaizen* in the company is submitted as a proposal form. The same universal form is used. All employees are introduced to this form and trained how to correctly fill it during the mandatory workshop, which every new employee attends. Figure 12 summarizes employees' opinions regarding the *Kaizen* proposal form. 23,80% of the respondents indicated that the form was easily understandable and easy to fill. 46,5% believe that overall the form is good, but it takes too long to fill it. 19,80% of participants think that the form is too complicated, unclear and many questions arise than trying to fill it.

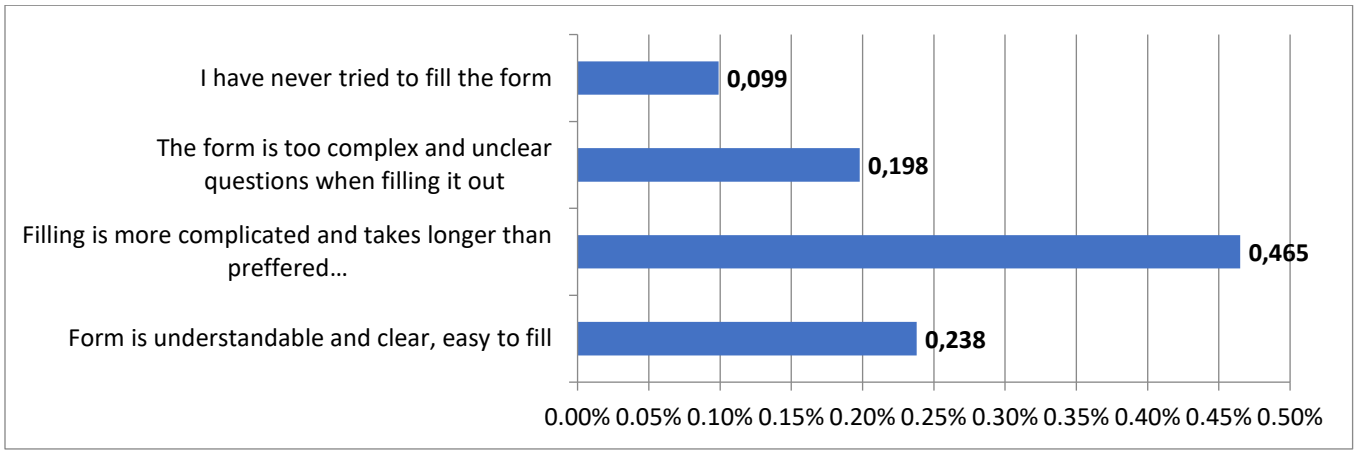

Figure 12: Respondents' views on the current form of the *Kaizen* proposal.

Source: composed by the author

Kaizen proposal form comes with a set of instructions, which should help employees to fill the form correctly. Figure 13 shows the results of questionnaire participants' opinions regarding these instructions. 44,60% of them believe that instructions are very helpful and comprehensive. 36,6.% of respondents would prefer instructions to be more specific and detailed, while 7,90% think that currently available instructions are too short and not insightful enough to help fill the form according to them.

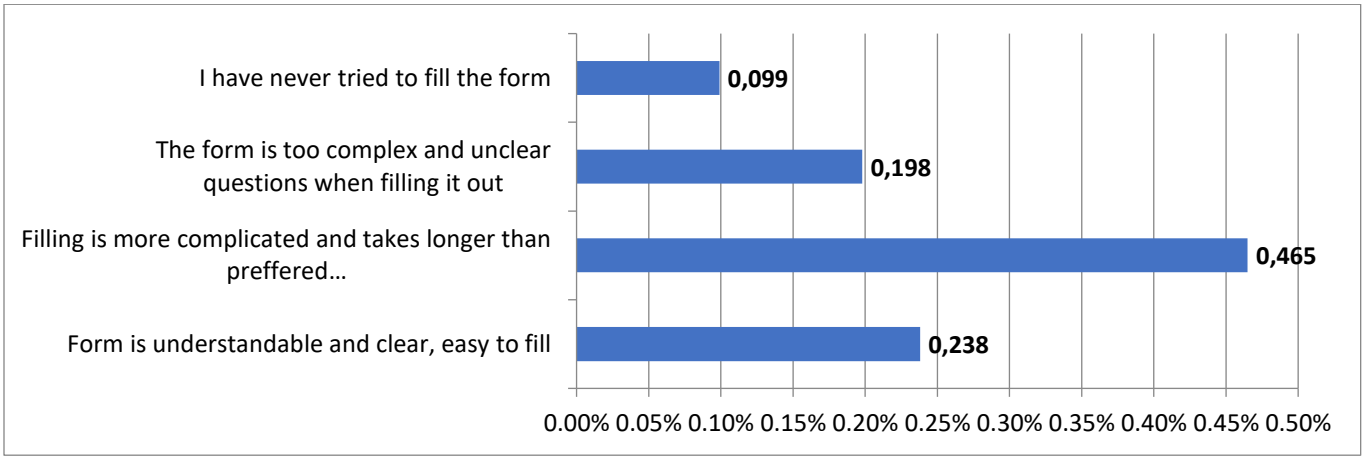

Figure 13: Evaluation of *Kaizen* form instructions.

Source: composed by the author

Respondents were also asked to evaluate, which part of the *Kaizen* proposal form is the most complicated (Figure 14). 61,40% identified that “5 Why” (finding the root cause) is the most challenging part of the application form. The difficulty of the other parts was evaluated similarly. These parts are a brief description of the issue (12,90%) and a description of the situation/process now and after implementation of the improvement (16,80%), other parts of the form (10,90%). Only 12,90% of the survey participants agreed that all parts of the form were equally not difficult to fill.

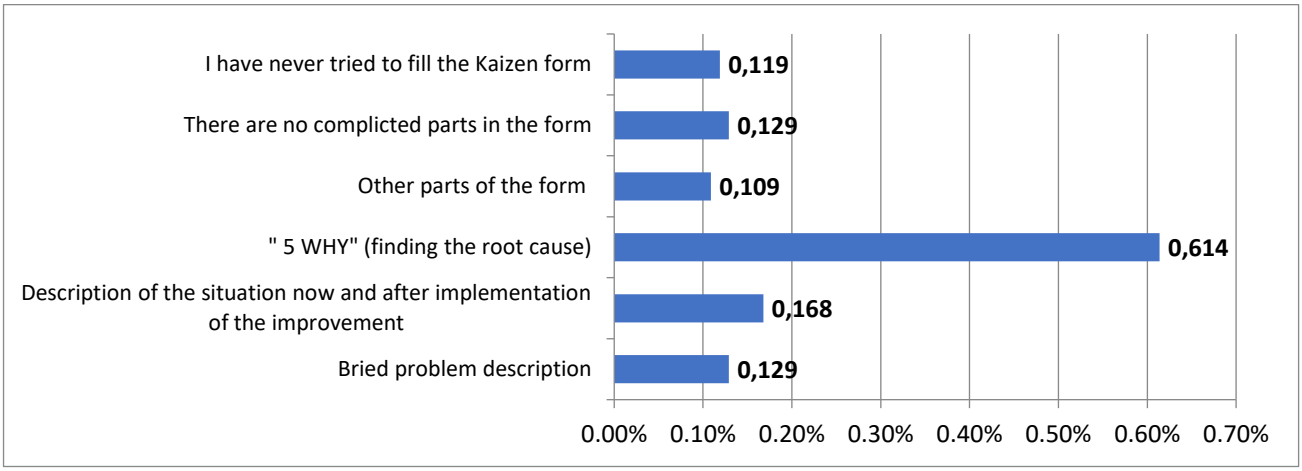

Figure 14: The results of participants' opinions regarding which part of the form is the most complicated to fill.

Source: composed by the author

Subjects were also asked if they understand how submitted *Kaizen* proposals are evaluated by the committee and according to what criteria decision is made if the proposal is accepted or rejected. According to the results shown in Figure 14, the majority of the employees who participated in the questionnaire either clearly understand the evaluation criteria (34,70%) or understand it partly and would like to get more information about it. (35,60%). 20,80% of the respondents stated that they do not understand the evaluation process at all.

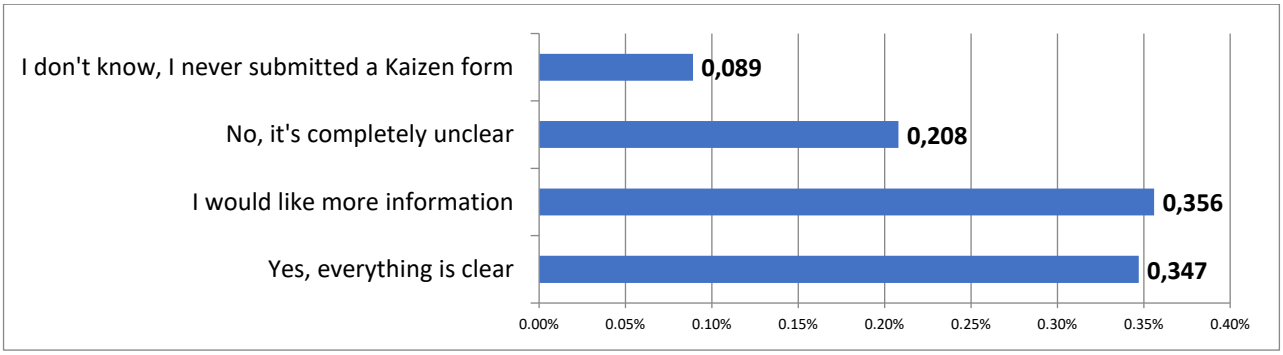

Figure 15: Distribution of respondents' opinions in assessing the clarity of the criteria according to which the committee evaluates *Kaizen* forms.

Source: composed by the author

Figure 16 shows the results of respondents' awareness of the fact that the assistance for employees in the preparation of *Kaizen* proposals is provided by the members of the Lean team. This dedicated team of people can supervise and assist with *Kaizen* project at all stages, to ensure that the best Lean practices are used and implemented. The majority of the respondents stated that yes, they knew about Lean team (69,30%), however, a third of the respondents stated that they did not know that where is a team, who they could contact regarding Lean tools. (30,70%).

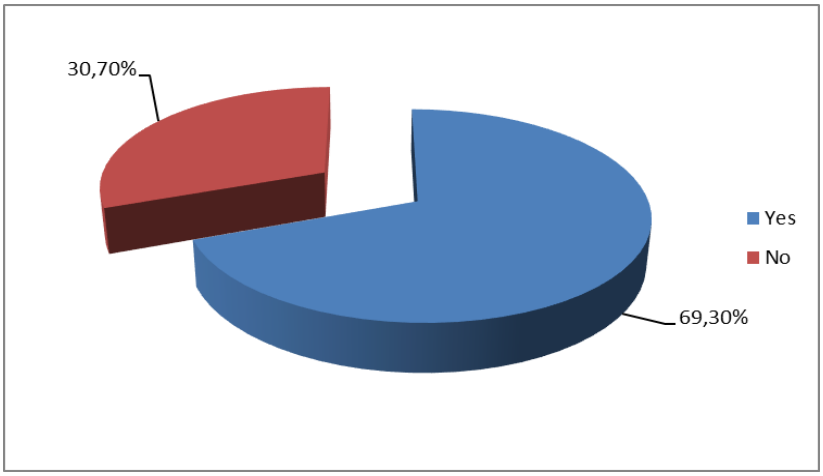

Figure 16: Respondents' awareness of Lean Group employees who can help employees in preparing *Kaizen* proposals.

Source: composed by the author

When assessing the distribution of respondents' opinions on whether they received support and help from the Lean group for their *Kaizen*, slightly less than half of the respondents stated that they did not receive any help (47,50%), while more than a third of respondents indicated that Lean team helped them to answer all the questions and solve the issues (30,70%), and slightly more than a quarter of respondents said they received partial help, but some questions remained unresolved (21,80%) (Figure 17).

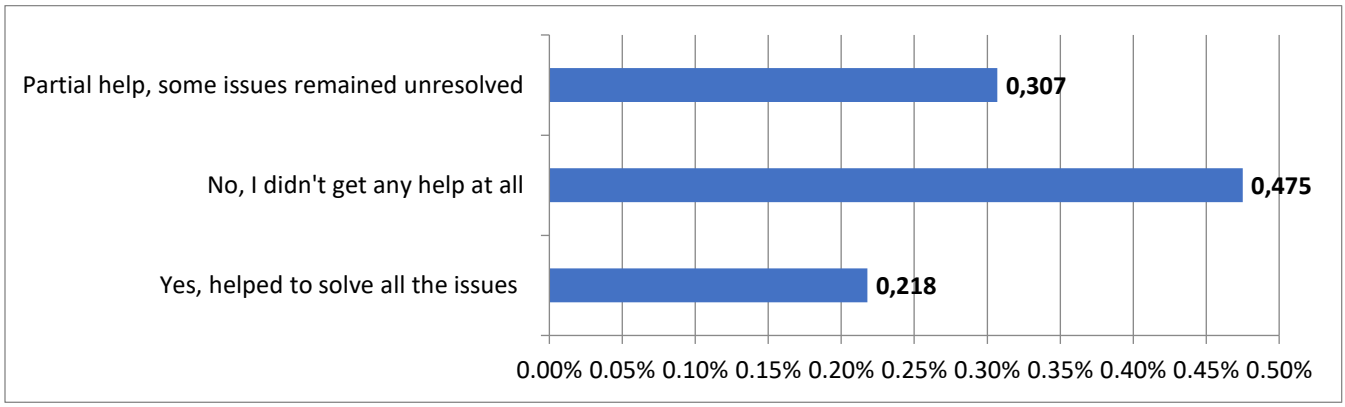

Figure 17: Distribution of respondents' views on whether they had been granted case assistance from the Lean Group for *Kaizen.*

Source: composed by the author

Participating employees were also asked if they feel like they are motivated by the managers to get involved in *Kaizen*. 34,70% answered that they feel some motivation from the management, it is not enough to make them keener on participating in *Kaizen*. 20,80% of respondents indicated that they get a lot of motivation from management to be involved, while 15,80% feel the opposite – that management does not motivate them at all. Interestingly, a high number (28,70%) of respondents were not sure how they feel about their management and motivation to purpose more *Kaizen* (Figure 18).

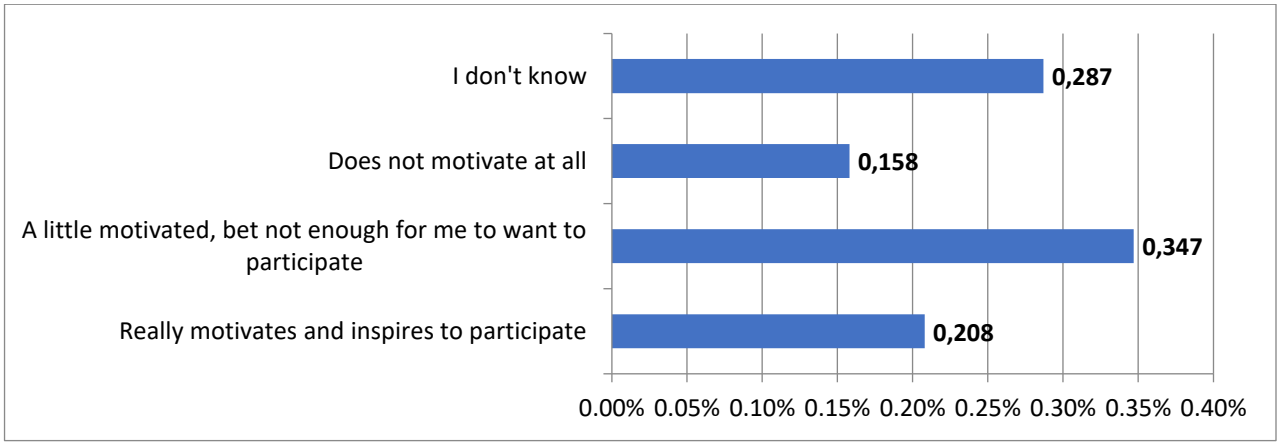

Figure 18: Distribution of respondents' opinions on whether managers motivate employees to get involved in *Kaizen.*

Source: composed by the author

All employees participate in Lean workshop, where they are introduced to Lean principles and tools, including *Kaizen*. The questionnaire participants were asked to evaluate the workshop in a Likert matrix. The majority of respondents stated that they agree with all four statements: that they understood that is a *Kaizen* (43,60%), how to make a *Kaizen* proposal (36,6%), they were taught and given all necessary information needed to get involved in *Kaizen* (24,70%) and training they received motivated them to get involved (32,70%). Similar, but slightly lower figures are seen in the "partially agree" field (Figure 19). The very low number (all figures under 7%) of participants indicated that they completely disagree with the statements, which would indicate, that the training workshop was not successful.

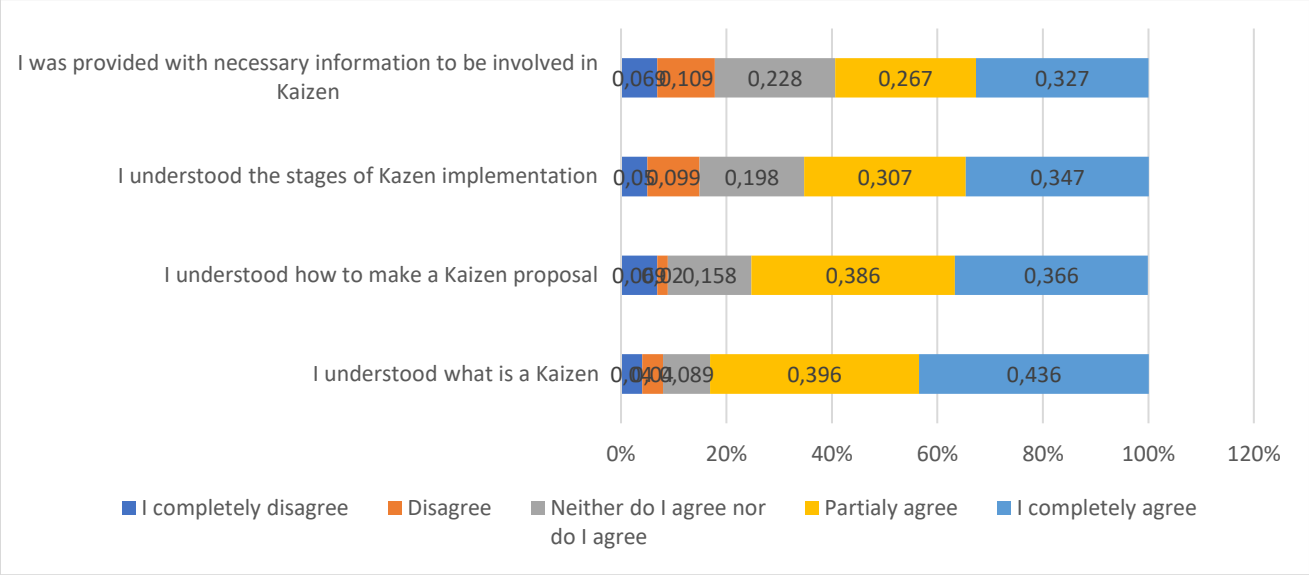

Figure 18: Distribution of respondents by participation in Lean training in which they were introduced to the *Kaizen* methodology

Source: composed by the author

The second Likert matrix respondents were asked to fill was related to understanding the purpose of Lean methodology and *Kaizen*, and if employees understand why this methodology is beneficial to the company and them. Results in Figure 19 show that a majority of respondents partially or completely understand why *Kaizen* is important for the company and what benefits it provides (37,60%). Only less than 13% indicated that they do not understand this methodology. *Kaizen* helps a company to grow and adapt to a changing market (33,70%), slightly more than a third of respondents disagreed, that they like the idea of perhaps taking the initiative themselves, slightly less than a third of respondents disagree, that *Kaizen* is a good way to be noticed (29,70%), slightly more than a third of respondents neither agreed nor disagreed that *Kaizen* helps them to better understand the company's processes (38,60%), slightly less than a third of

respondents disagree than do not agree that the implementation of *Kaizen* facilitated their daily work (26,70%), slightly less than half of the respondents indicated that they do not agree, his *Kaizen* allows improving working conditions (46,50%).

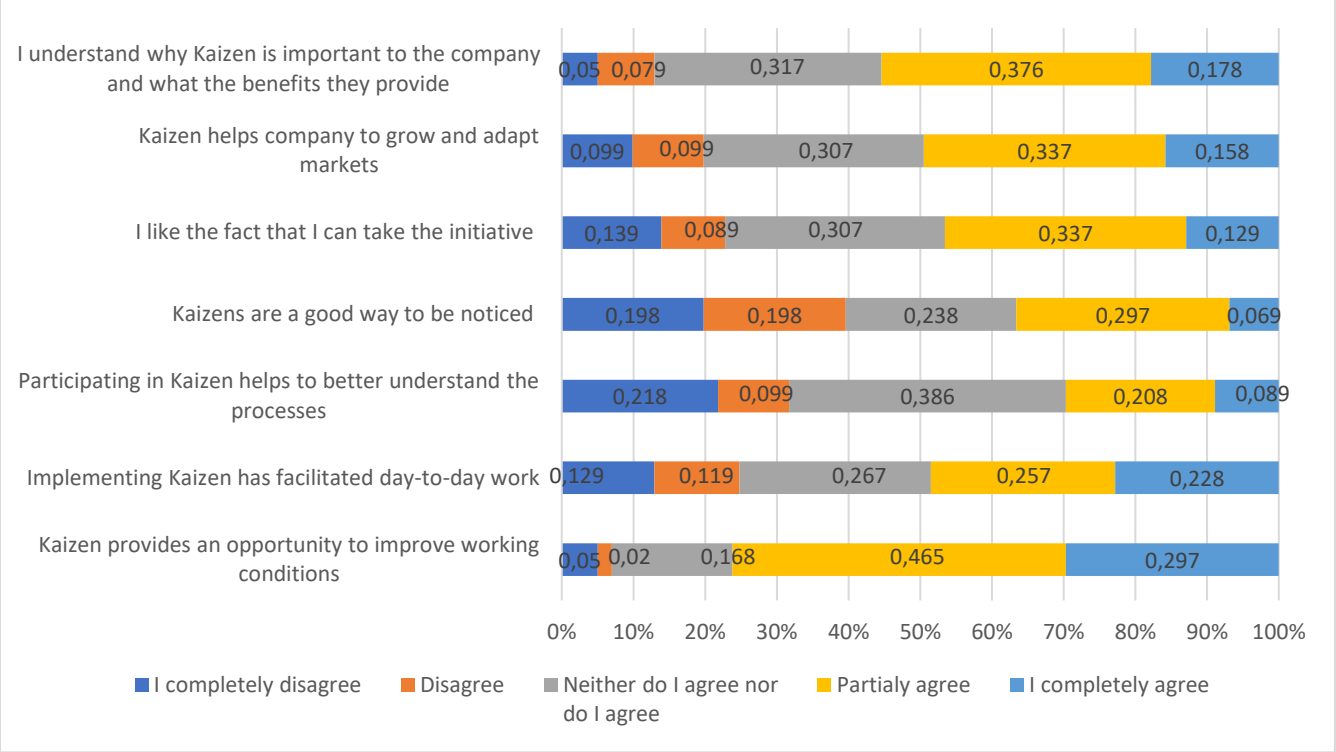

Figure 19: Evaluation of respondents' understanding of *Kaizen* methodology and its activity and benefits for employees and the company.

Source: composed by the author

Respondents were also asked to evaluate their motivation to be involved in *Kaizen* projects and proposals, as well as the potential benefits *Kaizen* can provide them. Results are summarized in Table 4.

A survey of respondents' sentiment and motivation to get involved in *Kaizen* found that more than a third of respondents disagreed that *Kaizen*'s proposals were useful and necessary for the employee (33,70%), while more than a third of respondents indicated that they neither agreed nor disagreed. Statement that participation in *Kaizen* receives more attention from the supervisor / colleagues (35,60%), slightly more than a third of respondents neither agree nor disagree that participation in *Kaizen* allows them to improve (34,70%), more than a third of respondents noted that they disagree with the fact that participation in *Kaizen* brings them closer to their colleagues (33,70%), with slightly more than a third of respondents fully agreeing

and neither agreeing nor disagreeing with the statement that the involvement of other employees in *Kaizen* motivates them to participate in the program; (30,70%), with more than a third of respondents stating that they neither agree nor disagree to apply their knowledge and skills (33,70%), slightly more than a third of respondents indicated that they neither agree nor disagree with the statement that they feel that they lack creativity to participate in *Kaizen* (32,70%), slightly more than a third more than a third of respondents indicated that they neither agreed nor disagreed with the statements that they had ideas that could be turned into casein (30,70%); he simply lacks the motivation to make *Kaizen* proposals (31,70%), with more than a third of respondents fully agreeing that attending *Kaizen* offers better career opportunities (35,60%), and more than a quarter of respondents neither agreeing nor disagreeing with the statement that they like to receive prizes for the successful implementation of *Kaizen* offers (21,80%).

	I completely disagree	**Disagree**	**Neither do I agree nor do I agree**	**I do not agree**	**I completely agree**
Kaizen offers are useful and neeeded for the employees benefits	12,90%	11,90%	29,70%	33,70%	11,90%
When involved in *Kaizen* I get more attention from manager/colleagues	23,80%	19,90%	35,60%	15,80%	5%
Participation in *Kaizen* allows me to learn and improve	17,80%	18,80%	34,70%	22,80%	5,90%
Participation in *Kaizen* brings me closer to my colleagues	19,80%	33,70%	30,70%	13,90%	2%
The involvement of other employees in *Kaizen* motivates me to get involved as well	30,70%	17,80%	30,70%	12,90%	7,90%
Kaizen allows you to apply and use your knowledge and skills	17,80%	14,90%	33,70%	23,80%	9,90%
I feel lack of creativity to propose *Kaizen* or get involved	19,80%	18,80%	32,70%	18,80%	9,90%
I have no ideas that could be turned into *Kaizen* proposal	12,90%	20,80%	30,70%	23,80%	11,90%
I feel lack of motivation to make *Kaizen* proposals	13,90%	12,90%	31,70%	23,80%	17,80%
Participating in *Kaizen* opens up better career possibilities	35,60%	25,70%	25,70%	10,90%	2%
I like to get prizes for the successful *Kaizen* proposals	21,80%	11,90%	34,70%	15,80%	15,80%

Table 4: Evaluation of respondents' opinions regarding motivation and benefits of involvement in *Kaizen*.

Source: composed by the author

3.2. Results analysis

The evaluation of the results of the study sought to identify the main shortcomings of *Kaizen's* proposal process and how they could be addressed. The results of the survey showed that most participants believe they do not start the *Kaizen* proposal, even if they have an idea for it because the process overall seems to be overly complicated and long, where is also a lack of understanding of how exactly proposals are evaluated, which halts the whole process. The lack of involvement from managers in overall *Kaizen* activities and motivating employees to get involved also seems to be a serious issue as well. A significant number of respondents pointed out that *Kaizen*'s filling-in forms are too complex, leading to a lack of proposals for *Kaizen*. Motivating and training employees to get involved in *Kaizen* may be difficult, as some employees lack training or may lose knowledge and skills with time. A lot of employees expressed that heavy workload is of the important reason why they do not get involved in *Kaizen* and propose any ideas.

During the evaluation of the results of the study, respondents made suggestions/observations related to the presentation/execution of *Kaizen*. The results of the study showed that it is necessary to include more detailed instructions with examples to simplify the form-filling process. The current *Kaizen* award system is also not very motivating. Employees view it as either pointless or just a nice addition to the *Kaizen* process. It would be recommended to improve the rewards system with things, which would more motivate employees, for example, free lunch, earning additional budget for a team building, an extra day off, etc. It is recommended that the organization's management itself be involved in the Lean implementation policy and help other employees understand the benefits of participating in this policy. Overall then talking about *Kaizen* respondents feel a lack of enthusiasm and encouragement from the management side.

More than half of the respondents had submitted *Kaizen* bids since starting work at the company, with a maximum of 1 to 5 bids. After assessing respondents' reasons for not making *Kaizen* suggestions, slightly more than a quarter noted that they had no ideas that could be implemented with *Kaizen*. The survey found that the majority of respondents had previously been exposed to the Lean methodology before joining the company, and believed that the main purpose of applying *Kaizen* was to provide suggestions on how to improve the organization's business processes and to award points and prizes for gift vouchers. During the evaluation of the results of the study, the majority of respondents estimate that participation in *Kaizen* is possible, which motivates them to participate in *Kaizen*.

Of particular importance to respondents' participation and motivation to contribute to the application in *Kaizen* respondents propose to reduce the current workload and give more time and opportunities to participate in overall Lean activities. During the evaluation of the results of the study, the majority of

respondents noted that when applying *Kaizen* they have to face a long process of filling in the program form, and a quarter of the respondents do not understand the program, so they are reluctant to get involved in filling out the program. According to the respondents, it is the most difficult to understand the "5 reasons why" employees would like to get more information about the process of completing the program and get help from the Lean team to explain how the program works, as the majority of respondents said that Lean training was not useful.

Against this background, one-third of employees believe that implementing *Kaizen* is of no benefit to the organization, but to maximize the benefits of applying *Kaizen*, the organization's management and colleagues should be involved in the program implementation process, but also create favorable career opportunities. To improve the application of *Kaizen* in the organization, respondents provided suggestions/observations related to the presentation/implementation of *Kaizen*. The results of the study showed that it is necessary to include direct manuals in *Kaizen*'s operations and to simplify the filling form. The *Kaizen* system has a significant impact on the accumulation of points that previously disappeared and this did not motivate them to participate in the program without receiving any prizes. It is recommended to refresh the *Kaizen* according to today's needs. It is recommended that the organization's management itself be involved in the Lean implementation policy and help other employees understand the benefits of participating in this policy.

The *Kaizen* approach requires that all employees participate; therefore, everyone in the company is encouraged to play a role in *Kaizen* activities. *Kaizen* has three major components:

Perceptiveness: All *Kaizen* projects are based on identified problems. If no problem has been identified, there is no use for *Kaizen*.

Idea development: This stage requires more than one person to provide better innovative ideas; therefore, forming a *Kaizen* focus team for the identified problem is very important. In this team-assembly process, one key is putting employees who work in the problem area together to interact in this innovative team.

The decision, implementation, and effect: *Kaizen* is only valuable if and when it is implemented. In the decision-making process, the team identifies what appears to be the best solution to the problem being dealt with, and then begins the implementation process. Following implementation, the team is also responsible for evaluating the effect of *Kaizen* process once it has been implemented in the shop flow of a factory.

Transferring these three stages into a systematic approach, Figure 1 shows the flow chart of the *Kaizen* process employed in this case study. The following section of this article introduces, step-by-step, how a

Kaizen approach has been used to implement a pull cell design. The steps of this approach are summarized as follows:

1. Identify a problem.
2. Form a team.
3. Gather information from internal and external customers, and determine goals for the project.
4. Review the current situation or process.
5. Brainstorm and consider seven possible alternatives.
6. Decide the three best alternatives of the seven.
7. Simulate and evaluate these alternatives before implementation.
8. the product is currently too expensive to produce.
9. Present the idea and suggestions to managers.
10. Physically implement the *Kaizen* results and take account of the effects.

The following case study demonstrates the *Kaizen* practice.

The *Kaizen* process acknowledges the information at all levels of an organization through the incorporation of a special type of intense teamwork. In addition, process steps that require seven alternatives force teams to think "outside the box," which often results in major innovations. Finally, the general guidelines are fundamentally sound manufacturing practices, such as "one-piece flow" and the elimination of non-value-added practices.

When implementing the *Kaizen* approach, much of the responsibility lies with upper management. Pitfalls include the tendency of upper management to micromanage the teams and a lack of initial training in teamwork effectiveness.

The ability of an organization to respond to the rapidly changing global marketplace will eventually determine the ultimate success of that organization. The implementation of *Kaizen* addresses many of the needs that modern organizations face. While *Kaizen* brings continuous improvement, it also develops a communications network throughout the organization that intrinsically supports a method of checks and balances within daily operations. The daily trials and tribulations that upper management once confronted on their own are now solved by the workforce, increasing morale and allowing upper management to concentrate efforts on strategic planning.

Presentation to upper management is crucial for *Kaizen* to succeed because it allows upper management to observe the impact *Kaizen* is having on the success of the organization while keeping them in the information loop. Additionally, it provides an excellent method to train the entire organization on *Kaizen* implementation. The presentation can also be used to provide feedback to improve the implementation of

the *Kaizen* methodology, resulting in the continuous improvement the name *Kaizen* implies. This increase in visibility between upper management and the workforce establishes a high level of communication, creating trust and understanding, eventually resulting in improved employee relations and morale.

The concept of **'***Kaizen***'**, i.e. continuous improvement, was introduced by Imai, (1986) to define a business strategy that **'**involves everyone in an organization working together to make improvements without large capital investments. Later, Harmon and Peterson, (1990) described continuous improvement as the key to becoming a world-class manufacturer. Moreover, *Kaizen* events can generate positive changes **'**in business results and human resource outcomes**'** (Glover et al. 2011). For these reasons, the *Kaizen* concept and its empirical applications have been analyzed in the literature.

3.3. Research limitations

Conducted research had a few limitations, which should be acknowledged then analyzing the results. First of all, research was conducted at a medium-sized manufacturing company in Lithuania. Out of 200 employees, 101 participated in the questionnaire (50,50%), with the majority (47,5%) of them working in the administration department. Data from Table 1 and Table 2 indicates, that the administration department already has the highest involvement in *Kaizen* activities percentage. This suggests that data, collected during the research heavily reflect administration department workers' opinions. Considering that Lean is considered to be thriving the best in a Manufacturing environment, research data might not accurately depict the real situation in the Manufacturing department. Similar research at the larger manufacturing company, or even at multiple manufacturing companies would provide more accurate data for analysis.

Research framework and potential factors for employee involvement in *Kaizen* projects were formulated according to literature analysis. It is worth mentioning that reasons, determining low participation in Lean processes and in particular *Kaizen* were not researched before. More research with a larger respondent pool, target audience, and different data gathering is recommended to better understand this phenomenon.

While this research provides several benefits, the present work suffers from limitations that should be addressed in future research. First, the proposed methodology is applied to a unique case study. Future research will need to test the proposed methodology considering a larger number of cases, specifically from a cross-sector perspective, to evaluate the performance of the methodology in case of companies dealing with different products (e.g. in size and weight) or involving more and different resources, needed to complete the assembly tasks and/or handling activities. Considering different resources involved in the ALB

issue, future research could deal with the application of the proposed approach to assembly lines in which collaborative robots working together with humans are being introduced to test possible different details in standard work definition.

Secondly, results are limited by the sample size of participants. Out of 200 employees of the company 101 participated in the research, which is 50,5% of all employees. It means that results are obtained by a convenience sample method are considered to be non – representative sample and should not be considered as accurately representing an entire company. For results to be considered, at least 132 out of 200 employees from the company should have participated in the research.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

1. Identified company factors such as communication, training, management, process control, and reward systems are crucial for employee involvement in *Kaizen*. These results correspond to the findings of previous studies, mentioned in the literature analysis of the topic.
2. Identified personal factors (motivation and co–workers' support) also play an important role in employee involvement in *Kaizen,* which corresponds to findings of previously conducted related studies.
3. According to the research results, the main factors for employee involvement in *Kaizen* are training, management, and process control.
4. Employee participation in *Kaizen* brings benefits to both the company and employees themselves. Benefits for the company include savings, process optimization, and the creation of a dynamic and lean company. Employees receive benefits as becoming more knowledgeable in the processes, receiving recognition from their co-workers and management, as well as getting a chance to develop or improve skills in communication, leadership, problem-solving, "thinking outside of the box", multitasking and others.
5. The study showed that employee involvement in *Kaizen* is critical for the successful implementation of Lean methodology, which allows a company to be more dynamic, innovative and gives a competitive advantage.

Recommendations:

1. Additional training is required to improve the general understanding of the purpose of Lean activities, especially *Kaizen*. It seems that right now employees, especially in the manufacturing department do not fully understand why these activities are useful and what kind of benefits they can bring.
2. The company should review the current Lean training program, which is used for all new employees. The questionnaire results showed large discrepancies between the departments regarding the

understanding of *Kaizen* phenomena and involvement in it. Considering the differences in employee education, age, experience, and responsibilities separate training programs should help employees to better understand the processes, give more confidence to get involved. For example, training for manufacturing department employees should involve more practical tasks so employees could get more familiar and experienced with using different Lean tools including *Kaizen*.

3. Proposing at least one successful *Kaizen* (which is approved by the board) should be added as one of the mandatory requirements for all employees as their annual developmental goal. This would allow managers to follow the involvement of each employee, give additional support if needed. Also, it would help to identify the employee who is actively involved and exceed the expectations. Such employees should get additional acknowledgment and possibly prizes.

4. When implementing the *Kaizen* approach, much of the responsibility lies with upper management. Employees feel a lack of enthusiasm and encouragement from the managers. Pitfalls include the tendency of upper management to micromanage the teams and a lack of initial training in teamwork effectiveness. Additional training and discussion with managers at all levels should be helpful to improve the situation. Managers themselves should actively participate in *Kaizen* activities and show examples by their actions.

5. Management should review the current workloads. Many employees believe that the current workload does not leave enough time for them to participate in *Kaizen* activities.

6. The *Kaizen* process is successful because it employs the approach of designing a flexible, controllable, efficient, and unique manufacturing process. This process is driven by the employees of the company. It should be a priority for the company to continue to listen to their employees and empower them to get involved.

BIBLIOGRAPHY

Albors-Garrigos, J., Hervas-Oliver, J. L., & Marquez, P. B. (2008). When technology innovation is not enough, new competitive paradigms, revisiting the Spanish ceramic tile sector. *International Journal of Technology Management*.

Alfalla, L. R., Garcia, M. J., & Lopez, M. C. (2012). Is worker commitment necessary for achieving competitive advantage and customer satisfaction when companies use HRM and TQM practices.

Anand, G., & Kodali, R. (2009). Development of a framework for lean manufacturing systems. *International Journal of Services and Operations Management*.

Angelis, J., & Fernandes, B. (2012). Innovative lean: work practices and product and process improvements. *International Journal of Lean Six Sigma*.

Anitha, J. (2014). Determinants of employee engagement and their impact on employee performance. *International Journal of Productivity and Performance Management*.

Arcidiacono, G., Calabrese, C., & Yang, K. (2012). *Leading Processes to Lead Companies: Lean Six Sigma: Kaizen Leader & Green Belt Handbook.* Springer.

Arya, A. K., & Choudhary, S. (2015). Assessing the application of *Kaizen* principles in Indian small-scale industry.

Attridge, M. (2009). Measuring and Managing Employee Work Engagement: A Review of the Research and Business Literature. *Journal of Workplace Behavioral Health* .

Awad, M., & Shanshal, Y. A. (2017). Utilizing *Kaizen* process and DFSS methodology for new product development.

Bamber, G. J., Staton, P., Bartram, T., & Ballardie, R. (2014). Human resource management, Lean processes and outcomes for employees: towards a research agenda.

Barclay, R. C., Cudney, E. A., Shetty, S., & Anthony, J. (2021). Determining critical success factors for lean implementation. *Total Quality Management & Business Excellence* .

Barraza-Suarez, M. F., Smith, T., & Dahlgaard-Park, S. M. (2012). Lean Service: A literature analysis and classification.

Benson, G. S., Young, S. M., & Lawler, E. E. (2006). High-involvement work practices and analysts' forecasts of corporate earnings.

Berger, A. (1997). Continuous improvement and *Kaizen*: standardization and organizational designs.

Bhasin, S., & Found, P. (2020). Sustaining the lean ideology. *Emerald*.

Bonavia, T., & Marin-Garcia, J. A. (2011). Integrating human resource management into lean production and their impact on organizational performance.

Bortolotti, T., Boscari, S., Danese, P., Suni, H. A., Rich, N., & Romano, P. (2018). The social benefits of *Kaizen* initiatives in healthcare: an empirical study. *International Journal of Operations & Production Management*.

Caliskan, N. (2016). TEAMWORK THE LEAN WAY. *European Journal of Business, Economics and Accountancy*.

Cappelli, P., & Neumark, D. (2001). Do “High-Performance” Work Practices Improve Establishment-Level Outcomes?

Cappelli, P., & Rogovsky, N. (1998). Employee Involvment and Organizational Citizenship: Implications for Labor Law Reform and "Lean Production".

Carmeli, A., & Gittell, J. H. (2009). High quality relationships, pshychological safety and learning from failures in work organizations.

Chafee, E. E. (1993). The *KAIZEN* Leader: Continuously Improving Administration.

Chan, C. O., & Tay, H. L. (2018). Combining lean tools application in *Kaizen*: a field study on the printing industry.

Chandani, A., Mehta, M., Mall, A., & Khokhar, V. (2016). Employee Engagement: A Review Paper on Factors Affecting Employee Engagement. *Indian Journal of Science and Technology*.

Chen, P. K., Lucan-Blanco, I., Fortuny-Santos, J., & Ruiz-de-Arbulo-Lopez, P. (2020). Lean Manufacturing and Environmental Sustainability: The Effects of Employee Involvement, Stakeholder Pressure and ISO 14001.

Cheser, R. N. (1998). The Effect of Japanase *Kaizen* on EMployee Motivation in U.S. Manufacturing.

Cheser, R. N. (1998). THE EFFECT OF JAPANESE *KAIZEN* ON EMPLOYEE MOTIVATION IN U.S. MANUFACTURING.

Cua, K. O., McKone, K. E., & Schroader, R. G. (2001). Relationships between implementation of TQM, JIT, and TPM and manufacturing performance.

Cullinane, S. -J., Bosak, J., Flood, P. C., & Demerouti, E. (2014). Job design under lean manufacturing and the quality of working life: a job demands and resources perspective.

Das, M. R., & Verma, C. P. (2020). An Empirical Use of Lean Management Methods to Aid Design and Development Planning for ETO. *Psychology and Education Journal*.

Dellen, J. D. (2016). The Philosophy of *Kaizen* and Telemedicine.

Desta, A., Asgedom, H. B., Gebresas, A., & Asheber, M. (2014). Analysis of *Kaizen* Implementation in Northern Ethiopia’s Manufacturing Industries.

Dibia, I. K., Dhakal, H. N., & Onuh, S. (2014). Lean “Leadership People Process Outcome” (LPPO) implementation model.

Doolen, T. L., Van Aken, E., Farris, J. A., Worley, J. M., & Huwe, J. (2008). *Kaizen* events and organizational performance: a field study. *International Journal of Productivity and Performance Management*.

Dora, M., Kumar, M., Van Goubergen, D., Molnar, A., & Gellynck, X. (2013). Operational performance and critical success factors of lean manufacturing in European food processing SMEs.

Erdogan, S. Q.-P., & Bond, B. (2017). An Empirical Tool to Measure the Effectiveness of *Kaizen* Events: A Case Study in the Wood Products Industries. *Forest Products Journal*.

Farris, J. A., Van Aken, E. D., & Worley, J. (2009). Critical success factors for human resource outcomes in *Kaizen* events: An empirical study. *International Journal of Production Economics*.

Farris, J. A., Van Aken, E. M., Doolen, T. L., & Worley, J. (2009). Critical success factors for human resource outcomes in *Kaizen* events: An empirical study.

Fullerton, R. R., & McWatters, C. S. (2002). The role of performance measures and incentive systems in relation to the degree of JIT implementation.

Fullerton, R. R., McWatters, C. S., & Fawson, C. (2003). An examination of the relationships between JIT and financial performance.

Garcia, J. L., Maldonado, A. A., Alvarado, A., & Rivera, D. G. (2014). Human critical success factors for *Kaizen* and its impacts in industrial performance.

Garcia, J. L., Maldonado, A. A., Alvaro, A., & Rivera, D. G. (2014). Human critical success factors for *Kaizen* and its impacts in industrial performance. *The International Journal of Advanced Manufacturing Technology*.

Garcia-Alcaraz, J. L., Oropesa-Vento, M., & Maldonado-Macias, A. A. (2017). *Kaizen Planning, Implementing and Controlling.* Springer.

Glover, W. J., Farris, J. A., Van Aken, E., & Doolen, T. L. (2011). Critical success factors for the sustainability of *Kaizen* event human resource outcomes: An empirical study. *International Journal of Production Economics*.

Guerrero, S., & Barraud-Didier, V. (2007). High-involvement practices and performance of French firms. *The International Journal of Human Resource Management*.

Hallgren, M., & Olhager, J. (2009). Lean and agile manufacturing: external and internal drivers and performance outcomes.

Hasle, P. (2012). Lean Production—An Evaluation of the Possibilities for an Employee Supportive Lean Practice.

Hiltrop, J. M. (1992). Just-in-time manufacturing: Implications for the management of human resources. *European Management Journal*.

Janjic, V., Todorovic, M., & Jonanovic, D. (2020). Key Success Factors and Benefits of *Kaizen* Implementation. *Engineering Management Journal*.

Jasti, N. V., & Kodali, R. (2014). A literature review of empirical research methodology in lean manufacturing. *International Journal of Operations & Production Management*.

Jimmerson, C., Weber, D., & Sobek, D. (2005). Reducing Waste and Errors: Piloting Lean Principles at Intermountain Healthcare.

Johnson, B. R., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *SAGE journals*.

Karim, A., & Arif-Uz-Zaman, K. (2013). A methodology for effective implementation of lean strategies and its performance evaluation in manufacturing organizations.

Khan, S. (1997). The key to being a leader company: Empowerment. *The Journal for Quality and Participation*.

Kinnie, N., Hutchinson, S., Purcell, J., Rayton, B., & Swart, J. (2006). Satisfaction with HR practices and commitment to the organisation: why one size does not fit all.

Kurilaitė, J. (2015, 08 13). *bzn start*. Retrieved 12 26, 2021, from https://bznstart.lt/verslas/pardavimai/lean-produktu-vystymo-sekmes-veiksniai/

Langley, G., Nolan, K., & Nolan, T. (1994). The Foundation of Improvement.

Liu, W.-H., Asio, S., Cross, J., Glover, W. J., & Van Aken, E. (2015). Understanding team mental models affecting *Kaizen* event success.

Loyd, N., Harris, G., & Gholston, B. D. (2020). Development of a lean assessment tool and measuring the effect of culture from employee perception.

Lucey, J., Bateman, N., & Hines, P. (2004). Achieving Pace and Sustainability in a Major Lean Transition. *Management Services*.

Mann, D. (2009). The Missing Link: Lean Leadership. *Frontiers of Health Services Management*.

Manos, A. (2007). The Benefits of *Kaizen* and *Kaizen* Events. *Quality Progress*.

Marin-Garcia, J. A., & Bonavia, T. (2015). Relationship between employee involvement and lean manufacturing and its effect on performance in a rigid continuous process industry.

Marin-Garcia, J. A., Garcia-Sabater, J. J., & Bonovia, T. (2009). The impact of *Kaizen* Events on improving the performance of automotive components' first-tier suppliers.

Markos, S., & Sridevi, S. M. (2010). Employee Engagement: The Key to Improving Performance . *International Journal of Business and Management*.

Melton, T. (2005). The Benefits of Lean Manufacturing: What Lean Thinking has to Offer the Process Industries.

Mitchell, M. L., & Jolley, J. M. (2004). *Research design.*

Moen, R., & Norman, C. (2006). Evolution of the PDCA Cycle.

Neirotti, P., & Pesce, D. (2019). ICT-based innovation and its competitive outcome: the role of information intensity. *European Journal of Innovation Management*.

Netland, T. H. (2015). Critical success factors for implementing lean production: the effect of contingencies. *International Journal of Production Research*.

Osborne, J. W. (2008). Best practices in quantitative methods. *SAGE*.

Pheng, L. S., & Teo, J. A. (2003). Implementing Total Quality Management in Construction Firms.

Power, D., & Sohal, A. S. (2000). Human resource management strategies and practices in Just-In-Time environments: Australian case study evidence.

Schneiderman, A. M. (1986). Optimum Quality Costs and Zero Defects: Are They Contradictory Concepts?

Scott, D. K., McMulen, T., & Royal, M. (2010). The Role of Rewards in Building Employee Engagement.

Shafiee, S., Wautelet, Y., Hvan, L., Sandrin, E., & Forza, C. (2020). Scrum versus Rational Unified Process in facing the main challenges of product configuration systems development.

Shan, R., & Ward, P. (2003). Lean manufacturing: context, practice bundles, and performance.

Shang, G., & Pheng, L. S. (2013). Understanding the application of *Kaizen* methods in construction firms in China.

Singh, J., & Singh, H. (2009). *Kaizen* Philosophy: A Review of Literture.

Sohal, A. S., & Egglestone, A. (1994). Lean Production: Experience among Australian Organizations.

Sokovic, M., Pavletic, D., & Pipan, K. K. (2010). Quality Improvement Methodologies - PDCA Cycle, RADAR Matrix, DMAIC and DFSS.

Sraun, J. S., & Singh, H. (2017). Continuous improvement strategies across manufacturing SMEs of Northern India: An empirical investigation. *International Journal of Lean Six Sigma*.

Styhre, A. (2002). *Kaizen*, Ethics, and Care of the Operations: Management After Empowerment. *Wiley Online Library*.

Suarez-Barraza, M. F., Ramis-Pujol, J., Kerbache, & Laouchine. (2011). Thoughts on *Kaizen* and its evolution: Three different perspectives and guiding principles.

Vinodh, S., & Joy, D. (2011). Structural Equation Modelling of lean manufacturing practices.

Vivan, A. L., Huertas Ortiz, F. A., & Paliari, J. C. (2016). Model for *Kaizen* project development for the construction industry.

Weber, R., Schek, H. J., & & Blott, S. (1998). *A quantitative analysis and performance study for similarity-search methods in high-dimensional spaces.* VLDB.

Westgaard, R., & Winkel, J. (2011). Occupational musculoskeletal and mental health: Significance of rationalization and opportunities to create sustainable production systems - A systematic review.

Wickramasinghe, G. L., & Wickramasinghe, V. (2017). Implementation of lean production practices and manufacturing performance: The role of lean duration.

Zhang, B., Niu, Z., & Liu, C. (2020). Lean Tools, Knowledge Management, and Lean Sustainability: The Moderating Effects of Study Conventions. *Sustainability*.