

## COMPLAINT ANALYSIS AS A TOOL FOR PRODUCT IMPROVEMENT: A CASE STUDY OF BABY STROLLER MANUFACTURING

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**Purpose:** A significant source of information regarding product quality for a company is the complaints lodged by customers. The analysis of complaints can provide the company with valuable insights. Therefore, the objective of this study is to analyze complaints from a one-month period within a company manufacturing baby strollers. The analysis of complaints was conducted to identify areas within the studied company where discrepancies occur, enabling appropriate corrective actions to be implemented.

**Design/methodology/approach:** The Pareto chart was utilized to conduct the analysis of complaints, illustrating the group of most significant issues. To delve into the root cause of the problem, a task force team employed the 5 Whys method. In the article, based on conducted literature reviews, a theoretical description of quality management tools and methods such as the Pareto chart, the 5 Whys method, Kaizen philosophy, teamwork, and additionally, information regarding product quality and safety can be found.

**Findings:** During the course of our work, the source of failures within the company was identified. The major issue turned out to be haste, affecting both the production staff and an external company collaborating with the enterprise. As part of the corrective actions, a motivational system was implemented for employees, and piecework norms were established within the company. Additionally, an innovative solution was applied in the examined enterprise through the design and creation of pattern books for inter-process control within the company and final inspection at the crossbar flat supplier. The proposed problem-solving methods within the enterprise can be applicable for future endeavors.

**Research limitations/implications:** The study was conducted over a short period of time due to the urgent need to address existing issues within the company. It can be inferred that if a longer time frame were taken into account, it would be possible to identify additional causes of discrepancies.

**Originality/value:** The obtained results can serve as a valuable source of information for other companies manufacturing baby strollers, which are seeking solutions to their own issues.

**Keywords:** products quality, Kaizen, 5why, team work.

**Category of the paper:** Research paper.

## 1. Introduction

In Poland, the market for children's products is highly developed, ranking fourth in terms of the number of online stores offering children's products. There are many companies involved in the production of baby strollers, with the Częstochowa region being a leading area in this industry. Polish entrepreneurs have the opportunity to showcase their products at both domestic and international baby fairs. However, a significant threat to businesses in the childcare sector is demographics, with recent years witnessing a low birth rate. In the case of baby strollers, an additional challenge arises from the growing popularity of the secondary market, favored by parents.

Baby strollers, serving as indispensable tools in family life, must be designed and manufactured with the utmost care for quality and safety. There are several key reasons why these two aspects are incredibly important for this type of product. Firstly, the quality of a baby stroller directly impacts its durability and resilience. A stroller with a sturdy construction and made of high-quality materials will serve for many years, passing it down from generation to generation. Moreover, high quality also means less susceptibility to malfunctions and greater resistance to daily wear and tear, providing parents with peace of mind. Secondly, the safety of a baby stroller is invaluable. The child spends a significant portion of their day in it, making it crucial for it to be designed with maximum child safety in mind. Features such as a solid construction, stability, durable safety harnesses, and safeguards against accidental folding ensure parents that their child travels in safe conditions. It is worth noting that quality and safety are closely intertwined. High-quality craftsmanship of a baby stroller often goes hand in hand with ensuring the highest safety standards. Therefore, when choosing a stroller for your little one, it is important to consider both aspects to provide the child with the best travel conditions and give parents peace of mind.

Customer complaints are an important source of information regarding the quality of products, including baby strollers. This is a broad area that depends on the specifics of each company. Therefore, the topic has been discussed in general to emphasize the importance of conducting an analysis of customer complaints. It is worth noting that in many publications concerning service quality, this topic is often overlooked. Instead, they focus on typical methods used in such research, failing to appreciate the valuable insights that complaint analysis can provide.

We often have a negative perception of complaints due to their demanding nature. However, it is important to emphasize that they represent one of the most significant sources of information about product quality that a company can leverage. If a company treats complaints as routine issues that need to be resolved as quickly as possible, it may indicate a lack of understanding of the role of complaints in assessing quality. Furthermore, the way in which a company receives and handles complaints can negatively impact its reputation in the eyes of the customer.

A challenge lies in utilizing complaint data to make informed decisions. By leveraging this information in processes related to design, marketing, distribution, and after-sales service and maintenance, significant insights into customer preferences and market trends can be obtained. Moreover, complaints should not be solely viewed as a negative phenomenon. They serve as signals indicating product weaknesses and reasons for customer dissatisfaction, enabling effective responses from the company. A worse scenario is when a customer fails to report a complaint but instead shares their negative experiences with others and publishes them on various social media platforms, leading to poor publicity for the company and the inability to intervene to resolve the issue and satisfy the customer (Ingaldi, 2022).

The aim of this study is to analyze complaints from a selected period in a company manufacturing baby strollers. The study aims to utilize selected quality management methods and tools to identify areas of discrepancies and implement corrective actions accordingly. The Pareto chart was employed for analysis, illustrating a group of significant issues and identifying their underlying causes using the 5 Whys method. In the examined company, haste emerged as the major problem, affecting both production employees and an external company collaborating with the enterprise. As part of the corrective measures, a motivational system for employees was introduced, and piecework norms were established. Additionally, a pattern book was designed and created for a key component of the baby stroller, aimed at introducing inter-process control by employees and implementing final inspection at the suppliers.

## **2. Literature review**

Running a business in today's times presents significant challenges for enterprises. This encompasses a range of interactions with the environment, which can generate both uncertainty and risk, as well as opportunities for rapid development and profit growth. The key to capitalizing on these potential opportunities is flexible business management, enabling quick responses to changing market conditions (Biadacz, 2024). Achieving success is a complex process that cannot be reduced to a single specific list of factors. Nonetheless, analyzing these factors allows for the identification of certain regularities that can be useful for businesses. There are many elements influencing success, the thorough analysis of which can aid in their prioritization. The appropriate combination of these factors can, in turn, lead to the development of a cohesive "success strategy" for the enterprise (Czerwińska, Pacana, 2023). Success in business increasingly depends on an approach to sustainable environmental development, working conditions, safety (Lazar et al., 2022) of work and products, and the quality of these products. The dynamic manufacturing market affects product quality and production process efficiency, significantly influencing the company's position in the market and its competitiveness (Pacana and Czerwińska, 2023).

Product quality meets the needs and expectations of customers. Products characterized by low quality lead to complaints, customer dissatisfaction, and loss of trust. For companies, product quality is a crucial factor in competitiveness. The market offers a vast array of products, some of which may pose risks to life and health. Therefore, entrepreneurs bear full responsibility for the quality and safety of their offered products. Companies that prioritize product quality can gain a competitive advantage and earn customer trust. Furthermore, product quality contributes to building the company's image as a producer of reliable, innovative, and sturdy products. Product quality is important for both customers and businesses in internal processes. Companies focusing on quality can succeed in the market by minimizing costs associated with complaints and repairs, increasing production efficiency, and fostering better relationships with suppliers. Product quality is a determinant factor of a company's success or failure in the market. The first person to define the term "quality" was Plato. The Greek philosopher described quality as a certain degree of excellence. This definition was expanded to include objective and subjective characteristics. Attributes such as weight and shape fall under measurable, objective characteristics, while color and scent belong to subjective traits. In the context of a product, quality attributes can include (Tamimi, Sebastianelli, 2022):

- functionality (determines the level of fulfillment of expected functions by the product),
- practicality (assesses whether the use of the product is intuitive, simple, and comfortable),
- reliability (determines the period of time during which the product will not require repairs),
- durability (determines the period of time during which the product maintains its functional characteristics),
- safety of use.

Product quality is closely linked to user safety. A high-quality product is made from suitable materials, complies with safety standards and regulations, and undergoes thorough testing. To minimize the risk of accidents and damage, manufacturers place significant emphasis on product quality during the design phase. Additionally, to prevent defects and enhance product safety, quality control is necessary at every stage of production, from raw materials to the finished product on store shelves. Quality control in the production process enables the creation of safe products that meet customer needs and provide a safe working environment. Safe and high-quality products benefit manufacturers by allowing them to build a positive company image and gain customer trust. For consumers, the benefit lies in increased safety and reduced risk of accidents or injuries. Three indicators are used to assess product quality (Tang, 2008):

- complaint rate (indicates the number of complaints relative to the number of products sold),
- customer satisfaction index (information about the level of customer satisfaction with the purchased product obtained through surveys or satisfaction studies),

- product quality index (overall assessment of product quality. evaluation of durability, reliability, performance, safety of use, compliance with standards. ability to compare the product with competing products).

In every enterprise, both product quality and safety are equally important. Standards such as ISO 9001, ISO 45001, or other quality and safety management systems place great emphasis on achieving both objectives. As a result, companies establish an overall organizational culture of quality and safety. This has many benefits for the enterprise, including conducting a greater number of studies, access to data, employee training, and greater focus of management personnel.

In today's dynamic business environment, the occurrence of discrepancies in manufactured products becomes a key challenge for enterprises. As research indicates (Potkány et al., 2021), such discrepancies not only lead to customer dissatisfaction by failing to meet their expectations but also generate excessive production costs. Faced with this reality, anticipating the number of discrepancy incidents becomes an essential tool for management, enabling better preparation for the future by identifying the most probable scenario. As aptly noted by Knop and Ziora (2022), it is better to know the future with a certain degree of certainty than to be limited to analyzing the past with 100% certainty. Predicting the number and types of discrepancies is therefore a crucial element of risk analysis, allowing for effective preventive action.

By utilizing Kaizen, it is possible to improve a selected product, which should have an impact on its quality and customer satisfaction. The essence of Kaizen lies in engaging all employees at various organizational levels in identifying problems, seeking solutions, and implementing small improvements on a daily basis. Kaizen promotes a culture of continuous improvement based on trust, collaboration, and the pursuit of excellence. Kaizen is a particular management approach aimed at achieving competitive advantage through continuous learning (Samadhiya et al., 2023) and incremental improvement of processes in every organization (Khan et al., 2019; Sordan et al., 2022; Goni et al., 2018).

In every customer-centric enterprise, all customer complaints are thoroughly and meticulously investigated. As research shows (Skotnicka-Zasadzień, 2010), the majority of discrepancies and errors in products arise during the production process. Therefore, it is crucial to carefully analyze all stages of this process to avoid complaints regarding the finished product, which in turn leads to increased costs for the company.

According to research conducted by Stauss and Scholer (2004), only an average of 24% of dissatisfied customers decide to directly lodge a complaint with the company, with only about half of them receiving satisfactory resolution of their complaint, as noted by Estelami (2000). This is a well-documented phenomenon, where many businesses struggle to effectively handle customer complaints. Andreassen (2001) found that 40% of customers who complained about services were dissatisfied with the complaint resolution process by the service-providing companies. Therefore, it is evident that companies must significantly enhance their efforts in handling complaints to ensure customer satisfaction.

It is important to emphasize that properly conducted complaint analysis can bring greater benefits to a company than any other quality-related research. Organizations should realize that handling complaints and analyzing them, despite the incurred costs, allows for the implementation of corrective actions aimed at eliminating the sources of defects. In the short term, such actions can lead to delivering high-quality products to customers that do not require complaints. This, in turn, contributes to increased customer satisfaction and sales growth. Therefore, continuous monitoring of complaint causes is essential in every enterprise (Balon, 2016; 2017).

In the complexity of customer complaints lie numerous valuable insights for a company, encompassing customer expectations towards the product, unmet requirements, and perceived product quality. Through complaints, enterprises gain insights into how to improve products or services to better meet customer needs (Barlow, Moller, 2001; Balon, 2016). From this, it can be inferred that customer analysis plays a crucial role in shaping and improving product quality.

The benefits of an effective customer complaint management system should contribute to increased operational efficiency by identifying trends and causes of complaints, resolving a greater number of complaints through a more customer-centric approach, engaging employees in new customer service training opportunities, and continuously monitoring and improving the complaint resolution process (BSI Group). Researchers emphasize the potential of complaint management systems and service improvement to enhance customer satisfaction (Smith et al., 1999). All information derived from customer complaints must be analyzed to enable strategic planning for improving the quality of services offered (Merril, 2009). Addressing and resolving complaints should serve as a catalyst for increasing customer satisfaction rather than a result of dissatisfaction (Ramphal, 2016), and also as motivation for improving one's own actions.

Addressing and resolving complaints should occur as swiftly as possible, even if it may seem annoying, time-consuming, and costly. Otherwise, it can lead to reputation damage caused by negative word-of-mouth. Handling customer complaints often represents the organization's last chance to change the customer's attitude and mitigate their dissatisfaction (Vincent, Webster, 2005). Responses to customer dissatisfaction should be embraced as direct customer feedback presents an excellent opportunity for organizations to learn and rectify mistakes (Thøgersen et al., 2003), restore customer trust, and strategically utilize feedback to enhance organizational performance (Johnston, 2001; Ramsey, 2003; Hughes, Karapetrovic, 2006; Ramphal, 2016).

The market associated with the children's industry is enormously demanding in terms of quality and safety. Companies producing products for children strive to introduce innovative and modern technologies. This is because entrepreneurs in the children's industry must meet stringent safety regulations for their products while meeting customer expectations. Articles intended for children entering the European market must undergo testing to determine their compliance with safety requirements specified by standards harmonized with the General Product Safety Directive No. 2001/95/EC (Krynke, Ingaldi, 2017). Every manufacturer of baby

strollers should familiarize themselves with the PN-EN 1888:2012 standard "Child use and care articles - Wheeled child conveyances - Safety requirements and test methods". Familiarity with standards is crucial in the work of baby stroller designers. To ensure compliance with norm requirements, the stroller designer pays attention to the following during the design stage (Rahman et al., 2017):

- Chemical safety of materials.
- Mechanical safety.
- Information for the user.

The materials used in the production of baby strollers, especially those that come into direct contact with the child's skin, should be chemically safe. They must not exceed the permissible limits for heavy metals, phthalates, and polycyclic aromatic hydrocarbons, as presented in Table 1.

**Table 1.**

*The limit values for elements according to the PN-EN 71-3:1994 standard*

Element	Permissible concentration
Antimony	60 mg/kg
Arsenic	25 mg/kg
Barium	1000 mg/kg
Cadmium	75 mg/kg
Chromium	60 mg/kg
Lead	90 mg/kg
Mercury	60 mg/kg


Source: Mańczak, 2015.

Exceeding the established limits in the standard may adversely affect the hormonal and reproductive system of children. Materials used in the production should not be flammable. Manufacturers opting for purchasing raw materials for the production of baby strollers should ensure that they are properly tested according to current standards. The stroller's design should not have sharp edges or protruding elements that could cause abrasions or cuts to the child's skin. Braking elements of the stroller should be easily accessible and easy to use for the caregiver, but inaccessible to the child in the stroller. The stroller's construction should be correct and stable. At the design stage, the weight of the child and possible additional loads should be taken into account (Soewardi, Nariswari, 2020). The standard requires the child restraint system in the stroller to include a crotch strap. Foldable strollers should have a locking mechanism to prevent folding while in use. Detailed requirements, test methods, and parameters are defined by the PN-EN 1888 standard. Manufacturers introducing baby strollers to the market are obliged to label them in accordance with applicable regulations. Parents and caregivers should be aware of all hazards associated with improper use and improper adaptation of the stroller to the child's age and weight (Soewardi, Nariswari, 2020). Clear information placed in a visible location for the customer is a basic safety requirement. Manufacturers of

baby strollers and other children's products that meet the requirements specified in the standards are focused on the quality and safety of the products offered (Mańczak, 2015). Key considerations before purchasing a baby stroller are presented in Table 2.

**Table 2.**

*Key aspects when choosing a baby stroller*

<p><b>Safety standards</b> PN-EN 1888:2012</p>	<p><b>Chemical safety</b> Textile materials must be chemically safe</p>	<p><b>Flammability</b> Textile materials must not be flammable</p>
<p><b>Fastenings</b> Child harness system with adjustable crotch strap</p>		<p><b>Edges</b> No sharp edges and protruding elements</p>
<p><b>Brakes and locks</b> Easily accessible for the caregiver. Inaccessible to the child in the stroller</p>		<p><b>Stability</b> During the design stage, the weight of the child and possible additional loads should be taken into account</p>
<p><b>Folding lock</b> At least one locking mechanism required</p>		<p><b>Labels</b> Information regarding the manufacturer's name, product name, standard number, and applicable warnings</p>

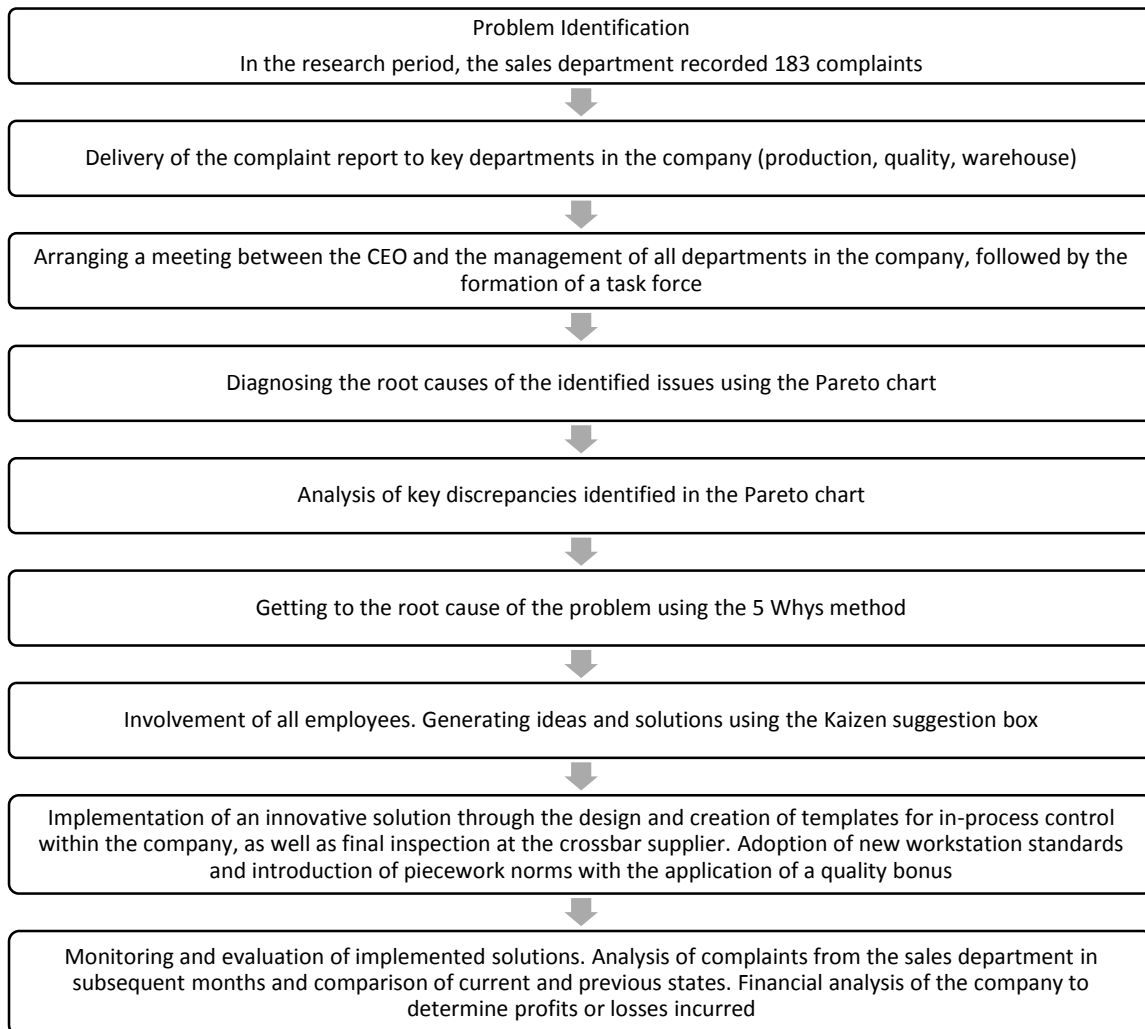
Source: own study based on Xiaoli et al., 2020.

### 3. Materials and methods

The article provides an analysis of complaints within the examined company over a selected period. This company has extensive experience in producing car seats and strollers. Quality and safety of the offered products are the company's top priority. Upon receiving a report from the sales department regarding complaints, the management expressed dissatisfaction with the existing situation. In a short period, the sales department recorded 30 types of stroller defects. With a production plan of 3001 units, 183 complaints reached a level of 6%. Due to the lack of acceptance of the current state, the company's management organized a meeting with representatives of key departments such as production, quality, and warehouse. During the meeting, the head of the quality department proposed forming a task force to identify the sources of problems and promptly implement corrective actions. Initially, a Pareto chart was created based on the complaint report, identifying 8 key issues causing the greatest losses in the company among the 30 types of complaints. With the appointed task force, the 5 Whys method was employed to trace the root causes of the problems. Recognizing that employees are a valuable source of knowledge, it was proposed, with the president's approval, to introduce a Kaizen box in the company. Through teamwork, the examined company managed to identify the sources of failures. An innovative solution was implemented by designing and creating templates for in-process and final inspections of the cross-shaped plate at the supplier.



Rush was also eliminated by introducing new standards and piece-rate norms with a quality bonus for employees. Finally, it was decided with the appointed task force to monitor and evaluate the implemented solutions. The procedure for solving problems in the examined company is presented in Figure 1.



**Figure 1.** Flowchart of the problem-solving process in the investigated enterprise.

Source: own study based on the material from the research object.

## 4. Results and discussion

In the initial stage of the investigation, the Pareto chart was employed, based on the theory that approximately 20% of causes account for about 80% of effects. This principle applies not only to manufacturing organizations but also to engineering and natural phenomena. By utilizing the Pareto chart, significant events and causes influencing the quality within the organization can be identified (Borkowski, Ulewicz, 2005). Identifying these events allows us to determine corrective actions aimed at enhancing the quality level within the enterprise.

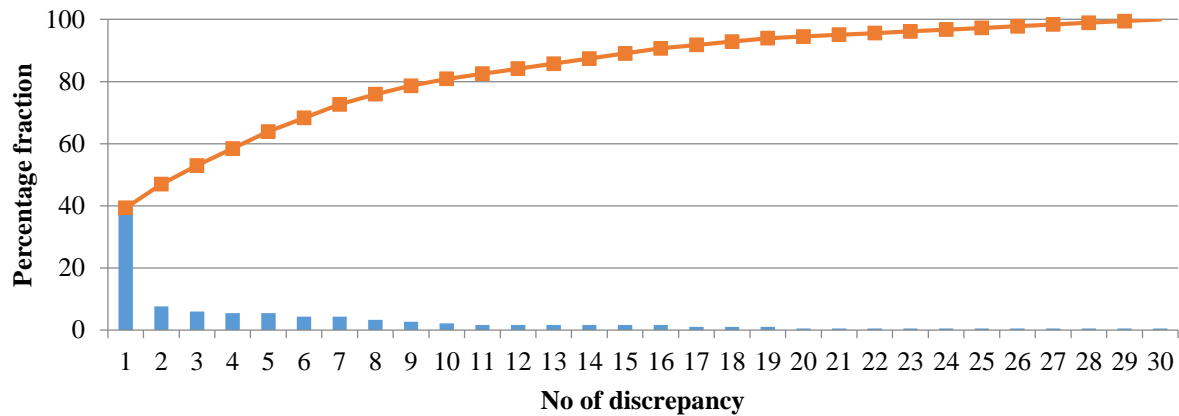
The Pareto distribution primarily focuses on factors triggering the problem. Consequently, we can address those issues whose resolution will bring the greatest benefits to the organization (Germanova-Kastreva, Dimcheva, 2020). Additionally, it enables us to pinpoint unnecessary costs at their source and thus implement cost-reducing measures (Borkowski, 2012).

Based on the data obtained from the surveyed organizational unit, the Pareto chart was created, as depicted in Fig. 2. In order to gather information regarding the key defects identified by customers, data was obtained from the sales department, as presented in Table 3. It is also worth mentioning the discrepancies that occurred during the production of the finished product. All discrepancies were detected by employees within the production facility before the delivery of the finished product to the customer and promptly addressed.

**Table 3.**  
*Prioritization of discrepancies*

No	Name of discrepancy	Occurrence	Percentage fraction	Cummulative percentage
1	Wheels: oscillating wheels, layered wheels, damaged rim in wheels, improperly mounted tire on rims, wobbling wheels	72	39.34	39.34
2	Crooked frame	14	7.65	46.99
3	Broken lock in the frame	11	6.01	53
4	Squeaky frame	10	5.46	58.46
5	Faded or damaged material in the bassinet	10	5.46	63.92
6	Damaged backrest in the pushchair	8	4.37	68.29
7	Damaged harness in the pushchair	8	4.37	72.66
8	Damaged recline adjuster in the bassinet	6	3.28	75.94
9	Difficulty in clipping the bassinet onto the frame/adapter not clipping in	5	2.73	78.67
10	Damaged canopy adjuster	4	2.19	80.86
11	Damaged parasol	3	1.64	82.5
12	Crooked bassinet insert causing improper positioning of the backrest	3	1.64	84.14
13	Pushchair bar not clipping in	3	1.64	85.78
14	Problem with harness adjustment	3	1.64	87.42
15	Problem with wheel locks	3	1.64	89.06
16	Torn handle in the frame	3	1.64	90.7
17	Dented bassinet	2	1.09	91.79
18	Dirty mattress and bag in the bassinet	2	1.09	92.88
19	Loose rivet in the frame	2	1.09	93.97
20	Problem with folding latch in the frame	1	0.55	94.52
21	Improper wheelbase in the car seat	1	0.55	95.07
22	Protruding wire in the canopy of the pushchair	1	0.55	95.62
23	Dented leather in the cross bassinet	1	0.55	96.17
24	Lack of spacing in the frame/looseness in the frame	1	0.55	96.72
25	Lack of axles in the stroller, lack of caps	1	0.55	97.27
26	Damaged plastic in the seat	1	0.55	97.82
27	Lack of screws in the forks	1	0.55	98.37
28	Canopy not aligning properly in the bassinet	1	0.55	98.92
29	Incorrectly packed color of the pushchair	1	0.55	99.47
30	Scratches on the swivels	1	0.55	100
	<b>SUM</b>	<b>183</b>	<b>100.00</b>	

Source: own study based on the material from the research object.



**Figure 2.** Pareto chart.

Source: own study based on the material from the research object.

During the analyzed period, the manufacturing company produced 3001 units of the finished product. There were 183 complaints recorded for the analyzed batch of strollers. In the studied month, the complaint rate in the company was 6%. Data indicates that over 70% of complaints were due to eight defects, which are presented in Table 4.

**Table 4.**

*Key discrepancy constituting approximately 70% of the complaints in research period*

No	Key discrepancy
1	Wheels: oscillating wheels, layered wheels, damaged rim in wheels, improperly mounted tire on rims, wobbling wheels
2	Crooked frame
3	Broken lock in the frame
4	Squeaky frame
5	Faded or damaged material in the bassinet
6	Damaged backrest in the pushchair
7	Damaged harness in the pushchair
8	Damaged recline adjuster in the bassinet

Source: own study based on the material from the research object.

Complaints related to wheels during the investigated period were at 39.34%. Customers reported experiencing the effect of oscillating and wobbling wheels while using the strollers on straight surfaces, which was inconvenient during walks. Additionally, there were cases where the tires on the wheels delaminated or slid off the rims. So far, the company had pneumatic wheels in its product range. Pneumatic wheels are filled with air. Although these wheels are flexible, they also have weaknesses because they are heavy and prone to punctures (Bengtsson, 2019). Before starting the analysis of complaints in the surveyed company, a decision was made regarding the change of wheel assortment. Such a decision was made due to the changing trend in the baby stroller industry. The new solution turned out to be gel and foam wheels. The surveyed company, aiming to meet the new trends, also decided to switch from pneumatic wheels to foam wheels. Foam wheels are much lighter, puncture-resistant, and the stroller is easier to handle (Bengtsson, 2019).

Another key group of defects in the analyzed complaints, at a level of 17.48%, turned out to be damaged components. Customers reported that despite purchasing a new product, it was damaged. The damages most commonly affected the stroller material or components made of scratch-prone materials. Regarding this issue, new packaging standards for baby strollers have been implemented in the company recently, so they will be analyzed in the later period.

The mentioned causes, constituting about 70% of defects in the company, relate to various departments of the organization. These problems concern not only the quality control department but also the production and warehouse departments. After the analysis conducted by the task team, focus was directed towards defects constituting about 19% of complaints during the investigated period. Crooked and squeaky frames, as well as broken locks in the frame, were issues that required immediate corrective actions. If the root causes of these problems are properly eliminated within the company, the overall number of complaints will decrease.

To identify the root cause of a particular issue, the 5 Whys method was employed. This method, also known as root cause analysis, involves asking "why" five times in response to the initial problem (Borkowski et al., 2006). The 5 Whys method is an integral part of Kaizen (Nur Syafie, Binti Shamsudin, 2022). The fundamental principle of Kaizen is continuous engagement and the desire to improve quality within the company. Kaizen is considered a philosophy because it changes the way of thinking, yet in practice, it consists of effective tools for implementing and maintaining changes within an organization. The Kaizen philosophy aims to reduce costs, improve quality, shorten process implementation time, and establish criteria for evaluation and rewards (Borkowski, Ulewicz, 2009).

In the analyzed organization, the Pareto chart indicates a variety of problems occurring within the company. Issues arise in various areas of the enterprise, and solving them by one person would be impossible. The best solutions and improvement ideas come from individuals who are directly involved with the problem. Therefore, as a result, the quality control department implemented an idea box in the company, where every employee could submit their ideas, as shown in Figure 3.

For the organization, the implementation of the Kaizen box proved to be highly beneficial. Gradually, a culture was fostered within the company where employees analyzed their work actively. They were engaged in developing new ideas and started to resist bad habits. The adoption of the Kaizen box was significant for the surveyed organization because, with minimal financial investment, the entire workforce steadily and systematically aimed to improve operations.

The initial ideas explored within the company weren't significant changes but rather small steps. The pursuit of continuous improvement yielded results, and it was found that there was never an endpoint because there was always room for something new. The overarching goal of the entire team was for the company to be better each day than the previous day, utilizing an effective form of employee motivation (Mauch, 2010).



**Figure 3.** Photograph of a Kaizen suggestion box.

Source: own study.

The first implemented idea from the Kaizen box was the introduction of an information board visible to all employees on the production floor. This board contained information regarding production quantity plans for the month and was updated daily. The team aimed to achieve the goal of producing a specific quantity of baby strollers. As a result, the board streamlined the verification and operation of the production process. Initially, a whiteboard supplemented with markers was used, as depicted in Figure 4. Later on, this board was replaced with a multimedia board.



**Figure 4.** A photograph of the first idea from the Kaizen box.

Source: own study.

Given the contemporary market conditions, the traditional approach to organizational change is highly inadequate. This applies to both small-scale organizations, such as the one examined, which can be classified as small in terms of the number of employees, and large

corporations. There is a significant need to engage all members of the workforce in the processes of change within the organization. For instance, consider Flextronics International Poland Tczew, which is a Polish branch of a company headquartered in Singapore. The company employs approximately 200,000 workers, with branches in 30 countries. It is involved in designing and producing electronic components and systems. Despite the complexity and variability of its operations, the company achieves excellent results. The company's successes can be attributed to its approach based on continuous improvement. The Tczew branch of Flex has won numerous awards in Lean and quality competitions (Walentowicz, 2016). In terms of Kaizen, it is recognized as the best branch in Europe, partly due to the system of motivating employees for Kaizen, as presented in Table 5.

**Table 5.**

*Key elements of motivating employees for Kaizen*

<b>High system efficiency</b>
1. Satisfactory financial rewards
2. Job providing opportunities for self-realization
3. Friendly relations and work atmosphere
4. Good organization of the system
5. Informational feedback
6. Rewards for pro-innovative activity
7. Employee appreciation
8. Climate conducive to innovation
9. Leadership management style and leading by example
10. Teamwork and problem-solving

Source: own study based on Walentowicz, 2016.

Teamwork methods are a specialized group of techniques used in quality management. There are many benefits associated with teamwork. These benefits stem from the parallel problem-solving process and greater possibilities it offers. In teamwork, a wider potential and greater experience can be leveraged. The processes leading to solving specific problems require a team with a broad range of knowledge. Additionally, the team should be characterized by spontaneity and creativity. Specialists from various fields should be appointed to the team, enabling the acceptance of proposed solutions and their immediate implementation (Borkowski, Corejowa, 2004). In the examined company, which is engaged in the production of baby strollers, a team was formed to analyze key defects constituting approximately 70% of complaints within one month, as indicated by the Pareto-Lorenza chart. The team's task was to identify the sources of problems and implement corrective and preventive actions. The team consisted of the following individuals:

- President of the company.
- Logistics and Supply Manager.
- Warehouse Manager.
- Production Department Manager.
- Quality Department Manager.

The team first focused on issues related to the baby stroller frame. Their task was to identify the root cause of problems such as crooked frame, broken lock in the frame, or its squeaking. The team began by asking the question: Why did this problem occur? The question was then repeated until the root cause was ultimately identified, as presented in Table 6. Questions should be posed in such a way as to elicit the best possible answer. The principle of analysis will be correct both in the case of a larger number of questions and if there are fewer questions (Brajer-Marczak, 2015).

**Table 6.**

*Investigating the problem using the 5 Whys method*

<b>Why is the frame crooked, squeaky, and why does the lock in the frame break?</b>
The reason may be the right/left crossbar. This element is crucial in the construction of the baby stroller frame.
<b>Why does this element have a negative impact on the stroller's construction?</b>
Because the assembler has trouble distinguishing between the right and left elements, resulting in several discrepancies in the frame.
<b>Why does the assembler fail to differentiate between the right and left crossbars?</b>
The assembler confuses the elements because they are not properly positioned.
<b>Why aren't the crossbars properly positioned?</b>
Because the assembler does not maintain order at the workstation.
<b>Why doesn't the assembler maintain order at the workstation?</b>
The assembler works on a piece-rate system. The main reasons for the lack of order are haste and a lack of consistency, as well as inadequate training in this area.

Source: own study.

Every company possesses four resources. These include financial, informational, tangible, and human resources (Griffin, 2000). Human resources are particularly crucial for a company as the success or failure of the enterprise depends on them. It is important for a company to develop an appropriate personnel management strategy. This involves providing adequate compensation for employees, offering training and development opportunities, and implementing effective career management and planning for employees. Employee compensation should be closely linked to their usefulness to the company while ensuring the employee's satisfaction. In a piece-rate payment system, employee compensation depends on the number of products produced. However, a piece-rate system without established work standards is a flawed system. Established work standards serve as a measure of the effort, efficiency, and quality of work provided by the employee (Ślósarz, 2012).

As the team delved into the root cause of complaints related to the baby stroller frame, it became evident that the rush of the assembly workers was the underlying cause of defects and discrepancies. The workers were compensated on a piece-rate basis without a set work standard, resulting in employees striving to earn the highest possible amount for their work. In pursuit of their goal, they paid little attention to the quality of their tasks, had no time to maintain order at the workstation, and disregarded occupational health and safety regulations.

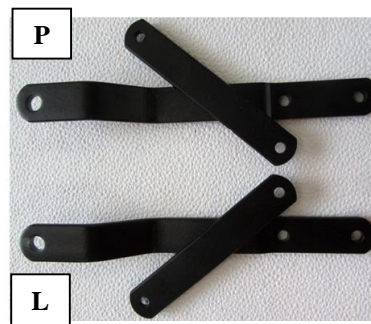
As corrective measures within the company, piece-rate standards were introduced along with a quality bonus to motivate employees to produce high-quality products. Another concern for the team was that assemblers were mixing up parts and couldn't differentiate between the

right and left crossbars, which were crucial structural elements of the frame. Improper installation of the element resulted in the frame squeaking, the lock breaking, and a large angle of inclination of the mounted bassinet in the frame. This element consisted of two straight crossbars welded together at the appropriate angle, as depicted in Figure 5.

To eliminate human error at the workstation, templates were applied to the baby stroller frame assembly stations. These templates allowed workers to distinguish between the right and left elements and additionally verify the correct angle of welding the two crossbars, which significantly influenced the frame's construction.

As the team dug deeper into the root causes of the problems, it became apparent that not only the rush of assemblers within the company contributed to the issues, but also the haste at an external company. The company outsourced comprehensive welding services, including processing, welding, and cutting of metal components, to an external firm. This firm was tasked with producing a series of components needed for the assembly of the frame within a specified time frame, including the crossbars in this case.

It turned out that insufficient staffing, lack of final product control, the desire for profit, and hurried work resulted in series of elements welded at incorrect angles. Identified defective series were, of course, returned to the supplier, leading to even greater losses for them and production downtimes due to the lack of components. Ultimately, the decision was not made to change the external company, but as a compromise, the contract with the supplier was revised. The supplier will still be able to provide services, but under the condition of final product control and the use of appropriate templates.



**Figure 5.** Key element of the baby stroller frame.

Source: own study.

## 5. Conclusions

Baby strollers are an indispensable part of family life, providing convenience and mobility for both parents and their little ones. However, to ensure that this mobility is risk-free and comfortable for the child, the quality and safety of strollers play a crucial role.



Undoubtedly, the quality of a stroller is of paramount importance for the well-being of the baby and the convenient use for parents. With the increasing number of models available on the market, the criteria for assessing quality and safety are becoming more complex. In this article, the key aspects to consider when choosing a stroller to ensure maximum safety and comfort for the youngest users will be examined.

The market for children's products is highly demanding, with strict safety standards in place. Entrepreneurs face the challenging task of meeting the requirements of customers, who are often parents or guardians. This customer group has elevated purchasing criteria, as every parent desires something that is not only attractive and functional but above all safe for their child.

This work presents an analysis of defects and discrepancies over a one-month period concerning a company producing baby strollers. Using the Pareto chart, a group of defects and discrepancies is illustrated, highlighting the issues that need to be addressed first to minimize their impact. The company should strive more diligently to improve quality within the organization. Every failure in the company is a new learning experience from which appropriate lessons must be drawn to ensure that such situations do not recur in the future.

In the above example, teamwork among key representatives of the organization's departments was utilized to apply the 5 Whys method and identify the root causes of the problems. In this case, haste proved to be the greatest enemy of quality. Employees performed tasks quickly and carelessly because they did not have defined piecework standards. By implementing an appropriate motivational system for employees and introducing the Kaizen philosophy in the company, a positive change was possible, leading to the creation of an organizational culture conducive to improvement.

After conducting the problem analysis, the quality management techniques used were effective in identifying the root cause of the problem. The proposed problem-solving methods in the company can be applied in the future. However, it is essential to consider the limitations and challenges during the implementation of changes in the company. In the case of the analyzed enterprise, two groups of constraints were identified.

The first group pertains to financial factors. Complaints recorded in the sales department signaled problems within the company. The existing situation was unsatisfactory for the enterprise. Implementing corrective actions required financial investment related to project costs and the creation of a template for interoperative and final control at the cross-section plate supplier. During the problem-solving process related to complaints, production downtime often occurred, resulting in financial losses for the company.

The second type of constraint was related to human factors. Resistance to change among employees is inherent in human nature. Employees were unaware of the seriousness of the situation, and fear of the unknown was observed among them. Introducing new standards disrupted their old habits. Honest conversations with employees proved to be fundamental. The company conducted various training sessions to raise awareness among employees.

Management actively engaged employees in the change process, which increased their sense of value.

Human factors also posed a limitation in implementing changes, including resistance from the supplier. The supplier believed that the effort of implementing final control and the associated financial investment would outweigh the benefits. In this case, dialogue with the supplier and emphasizing the benefits persuaded them to continue the collaboration with the company under the new standards.

Analyzing complaints from the sales department in subsequent months will allow for a comparison of the current and previous states and draw conclusions on whether the corrective actions were effective. Additionally, conducting a financial analysis in the company will indicate profits or losses incurred.

The conducted research was not without limitations. The study was conducted over a short period due to the urgent need to address existing problems in the company. It can be assumed that considering a longer period would allow for the identification of other causes of discrepancies.

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