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Kaizen: A Continuous Process of Improving Companies

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Abstract
The companies working in the business world are contracted by even more demanding clients. To assure their stay in the market it is necessary to be in constant adaptation and to apply improvements in the usage of both practically and modally, independently of which field of work. During the development of this work, both theoretical and comparative analyses were solidified from studied concepts and the real application of working routines in a general manner. The purpose of this paper is to raise awareness to market professionals the importance of incorporating the continuous Improvement Process, through the Kaizen methodology, which consists of waste disposal based on common sense, the use of low-cost implementation solutions that draw on the motivation and creativity of employees to improve the practice of their processes and thus obtaining successful cases. The methodology used was literature searches, including books, dissertations, articles and successful cases performed in companies. The objective is to show the importance of Kaizen and know their strategies in the company. From the hypothesis that competition between companies is increasingly fierce and with globalization the current market became more competitive and has made it clear that the world is constantly changing. Through this work it was found that the Kaizen adds much in companies suffering from waste, so this work is intended to show successful cases that can help observe the earnings of companies with low implementation cost.

Key words: *Kaizen* – Continuous work in quality and reduction of waste.

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INTRODUCTION

Organizations have found that competition from current markets is given by necessities like reliable products and defect-free, fast deliveries, among others, largely influenced by the production function. The direction to be taken is to create competitive advantage through excellence in production practices. As Slack (1996) any company that produces with better service, faster, with more variety and cheaper than competitors has the best competitive advantage in the long run that any company could wish for. Therefore, the process of continuous improvement *Kaizen* meets the needs of companies in the current market perfectly.

Kaizen is a word of Japanese origin made up of two other Kai (change) and Zen (good), paraphrasing, it means a change for the better. Its origin occurred shortly after World War II, in which Japan came out with serious economic difficulties and imposed labor laws that strengthened and encouraged better working conditions for employees.

However, OAKLAND apud CHIAVENATO (2003, p 125) characterizes *Kaizen* as "a philosophy of continuous improvement of all employees of the organization, in order to complete their tasks a little better every day". IMAI (. 1994, p 3) describes this philosophy as follows:

"The essence of *Kaizen* is simple and straightforward: *kaizen* means improvement. Even more, *Kaizen* means continuous improvement, involving everyone, including managers and workers. The philosophy of *Kaizen* says that our way of life - whether at work, in society or at home - deserves to be constantly improved".

This work has as its theme show improvement solutions through the continuous improvement process, in which it is shown that the company will have lower costs and therefore higher profitability. It also demonstrates that the waste can be avoided in companies with *Kaizen*, using low-cost solutions. And it describes how employee engagement can improve practice in their processes. The fight against waste is the focus of the *Kaizen* philosophy.

With regard to scientific knowledge, the research seeks the theoretical foundation necessary to be used, given the ample range of information on the subject.

Due to the great need to search for information capable of resolving any inquiries on the subject, the research will be of great aid to the company in view of the large number of corporations that increasingly value the elimination of waste

The research was based on Ima (1994, 2000); Bookman (2012); Correa, Gianesi and Canon (2001); Qualitymark (1997); Qualitymark (1999); for the management and growth of *Kaizen* is based on IESDE Brazil (2012); Bookmam (2002); IESDE Brazil (2008).

The first chapter covers the concepts of the process of *Kaizen* improvements, the principles of philosophy and the challenges and benefits of continuous improvement (a process of change). The second chapter presents the tools for monitoring function such as: devices, procedures, charts, practical formulations, operating mechanisms that can be used in the quality improvement process in organizations. The third chapter covers the application of *Kaizen* in three companies in different market segments, analysis of the improvements and difficulties encountered, as well as standardization of results and advantages and benefits of *Kaizen.*

1 Introduction to *Kaizen* Philosophy

At companies, we repeatedly come across difficulties in certain activities or tasks and soon we have to analyze a solution without adding excessive cost and that makes us quickly to develop, so we search forms, manners and cultures so we can find satisfactory results to each type of problem or difficulty.

The *Kaizen* philosophy has been widely adopted in today's businesses because it acts exactly in how to minimize waste and always seeks continuous improvement in various departments.

Efficiency gains calls for improving the quality of products, reduction of production costs, increasing customer satisfaction and stimulation and motivation. The *Kaizen* can contribute positively to achieve these goals through continuous improvement to reduce waste and to minimize process variability.

The historical origin of this tool took place around the middle of the tenth century, in Japan. The success of this model in Japan was propelled by the oil crisis in the 70s, while the United States (after World War II, driven to become the main world power), watched the disappearance of continuous improvement in most of its industries.

The resurgence is due to the invasion of Japanese products and the competitiveness of Japanese companies in the late 70s and early 80s (JHA MICHELA and NOORI, 1996).

Next, Imai (1994) apud Costa explains in detail the achievement of the Japanese competitive advantage at the time: "After World War II, most Japanese companies had to start literally from scratch. Every day new challenges appeared to managers and workers alike, each day meant progress, implicated in an endless process. Thus, there will always be something in the operation to be questioned and re-questioned so that it can be improved and making *Kaizen* to become a way of life. The tools that have helped raise the *Kaizen* concept were presented in Japan at the end of the 1950s and the beginning of the 1960s for quality management such as W.E. Deming and J.M. Juran; however, most new concepts, systems and tools that are often used today, were also developed in Japan with the implementation of qualitative improvements in statistical quality control and total quality control in the 1960s ". Ishikawa (1986), states that the educational system, the writing and discipline were some of the key ingredients for restructuring and increased competitiveness of Japanese companies.

The renewed U.S. interest in the continuous improvement of business came back in the early 80s, this time bringing an increase in the volume of reports and studies on this topic. In Brazil, continuous improvement is perceived as the end or result of some other process than an ongoing process covering the entire company (lack of systemic vision). This demonstrates that the subject continuous improvement in Brazilian studies is still at an early stage.

There are many opportunities once the culture of continuous improvement is not fully inserted in organizational environments. For the implementation of *Kaizen* programs in Brazil, many adaptations are allowed, given the local needs.

1.1 Continuous Improvement

According to Chaves (2005), continuous improvement is a system that aims to promote teamwork and allow human growth through a constant exchange of ideas and knowledge among its components. Solutions, corrective or innovative, are the result of organized efforts of several people.

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The long-term success of an organization is related to its competitive advantage. Therefore, companies must work with the objective to achieve this competitive advantage, that is, work guided by key performance objectives. According to Robles (1994), a new form of global competition demands that companies are committed to the full and continuous improvement of its products, processes and employees.

About those major performances, Slack (2002) defines five, namely: quality, speed, reliability, flexibility and cost. Ensure quality advantage for the organization means doing things correctly, without committing mistakes and meeting the specifications. The advantage in speed means speed up the process, in other words, to minimize the time between the consumer's order and product delivery. Reliability refers to doing things on time. Flexibility, in turn, is linked to the preparation to change what you do, that is, be able to adapt production activities to meet unexpected circumstances. The cost ultimately is to make the products and/or services as cheap as possible. It is worth mentioning that the importance given to each of these goals depends on each organization operating market.

Therefore, becomes necessary for an organization to compete in today's market, the search for tools (Just-in-Time, Jidoka, Kanban, Leveling production, Pareto, Fishbone) aimed at keeping those major performances, which means, the highest quality at the lowest cost and the lowest runtime. Interestingly, the realization of continuous improvement only happens from the operation and the understanding of this set of tools by practitioners.

The adoption of specific continuous improvement tools and the structuring of operations management systems consistent with the company's goals are ways to make the tool production work efficiently and effectively in the pursuit of organizational development. Proving this line of reasoning, Masaaki Imai (1994) believes that *Kaizen* was and is actually the umbrella that shelters all Japanese management techniques, widely applied in advanced production technologies such as Total Quality Control (TQC) Zero Defect and Just-in-time (JIT).

Figure 1: Kaizen Umbrella

1.2 *Kaizen's* concept

Gilmore says that continuous improvement is the integration of organizational philosophies, technical and structural to achieve sustainable performance improvement in all its activities, uninterrupted and steadily.

The definition of continuous improvement can be defined as a planned process, organized and systemic of continuous character, incremental nature and scope of the company to improve performance.

Kaizen is Japanese and means "change for the better." The method was also named "continuous improvement process". The ideogram involves two letters: Kai (改) means change and; Zen (善) improvement.

The combination of these two letters means change for the better and incorporates in its meaning the status elevation "quo" on the previous state and gives a dynamic connotation. The word translated to Portuguese equivalent to Continuous Improvement.

The principle of *Kaizen* method is to actively include all the company's employees, at all stages of the continuous improvement process, as follows: Analysis, Planning, Execution and Confirmation (APEC Cycle).

Employee participation is based on the assumption that he is the most knowledgeable of the job which the problems operates, and therefore to request the cooperation of him, he is being encouraged to assist in solving the problem or its defect, contributing with useful information for decision making in the search for alternatives.

Undoubtedly, the addition of value to products and/or services is in the action of continuous improvement.

Creative solutions and low-cost application normally start from the base. Ideas / suggestions for improvement are output to many difficulties in a highly competitive and globalized environment.

However, an organization that employs waste reduction by using the *Kaizen* philosophy will attack the activities that can be discarded, which will mean the elimination of unnecessary activities and arising improvement which could generate financial results within delivery, product quality and process, among others. You can view the best benefit of *Kaizen* philosophy through the figure 02 below.

We can say that even with the competitions of large companies, the true differentiator for small businesses to gain space in the market is the production quality and total customer satisfaction. The market will be well attended and is of great value to the company, satisfied customers advertise without realizing it. The *Kaizen* process makes use of systematic improvement and control, that is, it is composed of various techniques and the main ones are:

- Guidance for the consumer - shows that consumer orientation is the set of beliefs that put consumer interests first. Heiens (1989).
- TQC - Total Quality Control (Total Quality Control) consists of the quality management system that translates the quality applied to the product, the quality it is seen as overcoming the customer expectations, and interested parties (stakeholders).
- Robotics - is a branch of technology that includes mechanics, electronics and computing.
- QCC - Quality Control Circles is the titration of the group of people who make suggestions for improvements in the industrial process of manufacturing a product group or a product specifically.
- System of suggestions – System created in order to improve, through suggestions. The ideas about products, processes and business, modified or new come from various sources, for instance: vendors, consumers, suppliers, managers and employees.
- Automation-process automation for the pursuit of "continuous improvement.
- Discipline in the workplace
- TPM - Total Productive Maintenance - Incorporate and develop continuous improvement process
- Kanban - Designates a method of manufacturing serial directed to supply processes, production and distribution.
- Quality Improvement - improve the level of quality, even if it's as expected.
- Just-in-Time - it is a production management system that shows that nothing is to be produced, transported or purchased before the exact time.
- Zero Defect - Crosby, creator of Zero Defects, based on the theory that quality is done effectively if all strive to realize its job right the first time.
- Cooperative relations between management and labor, Masterpiece workers and concentrate the minds of management at the company, rotated among the functions.
- Improved productivity – The philosophy of continuous improvement *Kaizen* has its most well-known phrase that says: "raising the level of quality, is increased productivity."
- Development of new products – key processes for competitiveness in manufacturing.

2 TOOLS FOR FUNCTION MONITORING

Several are the tools (devices, procedures, charts, practical formulations, and operating mechanisms) that can be used in the quality improvement process in organizations. These tools have different purposes and may contribute

in various ways, mainly with respect to processes such as, for example, for a description and understanding detailed thereof, for a review of different viewpoints, to synthesize knowledge and findings, provides elements for monitoring, facilitate understanding of problems and their causes.
There will be explained some quality improvement tools with more targeted actions for their evaluation processes and products.
According to Sharma (2003):
"The challenge for both organizations and for the more experienced fans of these methodologies is to understand that the meaning of Lean and Kaizen is to maintain solid and reliable process, while providing up to release waves of creativity and innovation to transform completely and continuously the way of how the work is done". Sharma (2003, p.73)

2.1 The PCDA Cycle

The PCDA Cycle, also known as Deming cycle (its creator), is widely used in organizational environments that seek continuous improvement of its processes. As Werkema (1995, p.17), the "PDCA cycle is a management method of decision-making to ensure the achievement of goals necessary to the survival of an organization." Therefore, the more information (facts, data and knowledge) are aggregated to the method, the greater the chances of achieving the goals. PDCA consists of four phases (Plan, Do, Check and Action), structured in a cyclic manner, and therefore a feature having a continuous and constant application. Each circle quadrant is represented by a phase to be applied to the following can be performed. This cycle can be best viewed by the following figure 02:

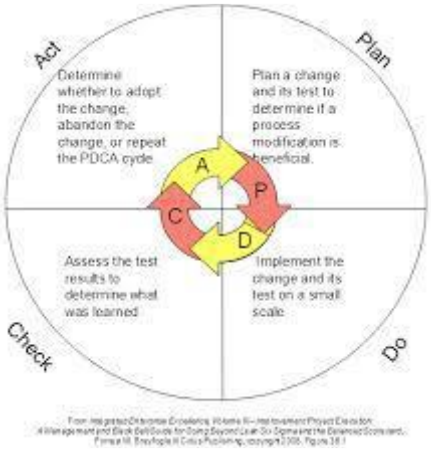

Figure 2 – PCDA Cycle

The initial phase (*Plan)* in which the organization needs to establish goals and disseminate it to all those involved in process improvement. At this stage the problem is identify and recognize its importance, followed by the observation thereof to investigate the specific feature of the problem with a comprehensive visualization from various points of view. This step is critical because it will be gathered information such as the historical problem of the losses generated by it, among other data as a basis for creating the action plan to be implemented. After this analysis of the problem, those involved determine their underlying causes and devise an action plan with strategies to block them.
The following phase (*Do)* begins with the qualification and training of those involved, disclosing the entire plan, with participatory meetings and training techniques. Then carried out the execution of actions putting into practice all the received qualification to block the causes of the problem and achieve the goals.
After planning and acting on it, it follows to the verification process (Check), which will be a check of the actual effects achieved by the implementation of the action plan. Should be compared the results to data collected still in the planning phase to verify the effectiveness of the problem of the blockade and the degree of reduction of it. The objective of this phase is to verify that the activities were carried out successfully and when it does not, take actions to set new directions.
Continuing the cycle, in the phase of action (Action), one can set the decision thoughts previously adopted. Corrective action on the causes of not achieving the goal may be taken (in this case the actions were not successful), or it can be applied to standardize the plan to adopt a more proactive approach in performing new works.

3 CASE STUDIES

3.1 Iochpe-Maxion

In 1990, the Iochpe-Maxion group assumed the control of a company and earned the ISO 9000 for automotive wheels.

In 1994, it acquired a line of medium-sized presses to stamp sleepers and rails of pick-ups and was implemented the E-coat system for chassis and stringers.

Later that year, the next big step was the manufacture of assemblies (rails and sleepers) for vehicles of S10 and Blazer line, in addition to the assembly lines of the chassis F1000, F400 and Mercedes-Benz truck.

With the dissolution of Auto Latina joint venture, formed by the union of Ford and Volkswagen assembly plants in 1995, Maxion Cruzeiro joins a pioneering and innovative project in truck manufacturing method: the modular consortium Volkswagen.

In 1998, due to the growing expansion of its activities, Iochpe-Maxion decided to split the company into two separate units: one facing the rail industry and casting: Maxion - Foundry and Railway Equipment, and Maxion Structural Components operating in Auto Parts and Implements sector road. This division aimed to increase the focus on the actions of each segment. There began a new phase marked by the autonomy of decisions and the conquest of new markets.

3.1.1 Sector Subset Soldiers (Bench Ford)

IMPROVEMENTS	IDENTIFIED	COMPLETED	PENDENT	OBESERVATIONS
5S	11	11	0	-
SAFETY	8	6	2	Improvement Opportunity :1
ERGONOMICS	8	4	3	Two problems have more than one action/Improvement Opportunity: 1
QUALITY	3	1	2	-
PRODUCTIVITY	3	1	1	Improvement Opportunity :1
TPM	9	8	1	Improvement Opportunity :1
TOTAL	42	31	9	

Figure 3 – Improvements Identification

Figure 4 – Impact x Effort Matrix

The following pictures demonstrate some of the improvements made and implanted in the sector:

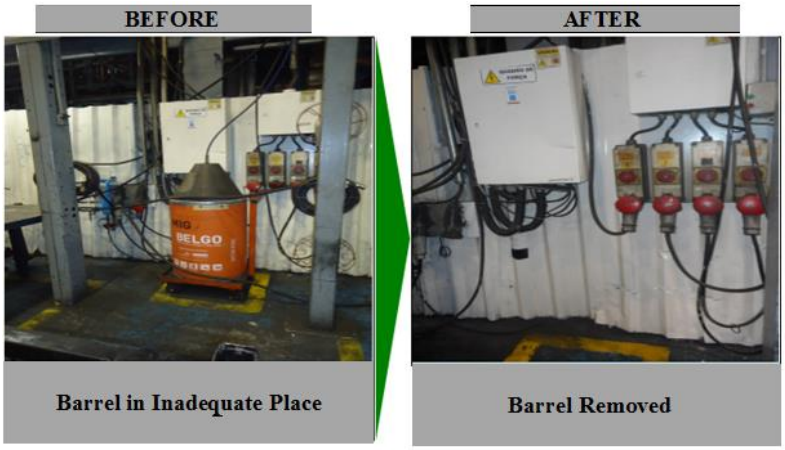

Figure 5: Implemented Improvements

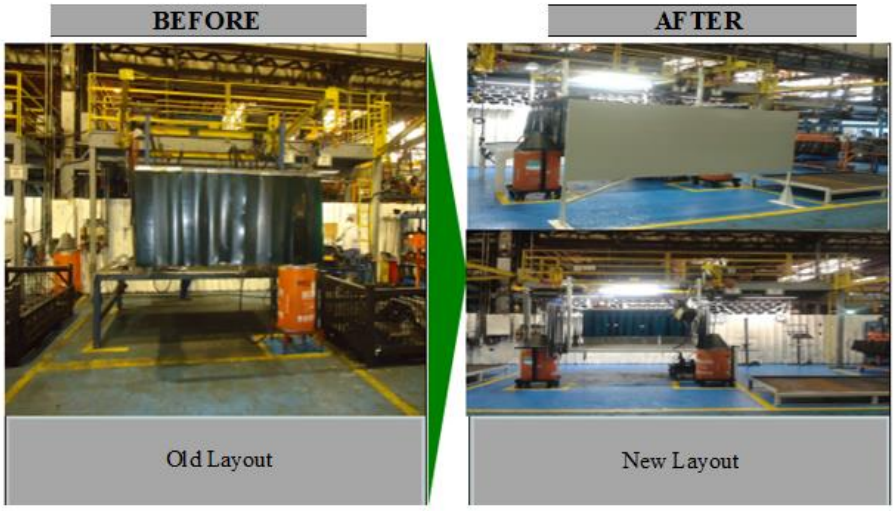

Figure 6: Implemented Improvements
Source: Elaborated by the Authors

CONCLUSION

The literature first showed how the pursuit of quality of processes evolved, the various stages and difficulties encountered over the centuries. There were many techniques created that varied according to the concept of quality assumed at the time until it reached the level it is today. The concern today is not only with a product or service without faults, but rather to reach the expectations of the modern consumer.

Kaizen allows an assessment of any productive business process to be performed. For this, it encourages the enhancement of a feature already obtained by the organization, his collaborator. The main idea is to seek in the human being, the knowledge to find solutions to quality issues in the activities they perform. The exchange of experiences, recording information and sharing of knowledge are important factors for improving organizations.

Both in Brazil and in other countries, the process of continuous improvement is directly linked to two factors: culture and the total involvement of top management. To deploy an improvement process in the companies, first of all the Directors have to give full support, even if the department has no knowledge of the philosophy, because to have an effective implementation, you need a lot of discipline, create rules and have to fulfill them. We can conclude that the tangible results already mentioned and also the intangible results that were presented by collecting data is evident that if a company is willing to improve its competitiveness and guaranteeing its sustainability, one of the shortest paths to achieve that, is through continuous improvement, that is, *KAIZEN*.

This quest for continuous improvement aims to achieve a competitive advantage by promoting creativity, integration and wellbeing of its employees.

Companies must adapt the model according to its own necessities, as demonstrated in the case studies. Obviously, there are practices that can make the *kaizen* event more productive, but if the reality of the company prevents all of them to be followed to the letter, philosophy can adapt to the needs and peculiarities of each company.

In addition to providing no measurable benefits, such practices promote greater stability for the processes, significant reduction of waste and, because people like to constantly improve the results, is a highly motivating task.

Finally, it is important to emphasize that the success of this tool will only occur after the involvement of everyone in the company, from top management to operators within the continuous improvement process, since it can be considered as the basis for the realization of the guidelines placed at strategic planning.

REFERENCES

CORRÊA, H. L. GIANESI, I. G. N. **Just In Time, MRPII e OPT**; Um enfoque estratégico. 2.ed. São Paulo: Atlas, 1996. 183 p.

COSTA, D. **Aplicação do *Kaizen* na logística**: **as pessoas como fator de sucesso no desenvolvimento da empresa**. 2007. Revista Técnica IPEP, São Paulo.

Glauco G. M. P. da Silva; Sigfrid Hornburg; Dalvio Ferrari Tubino; Marcos Romig; Gilberto J. P. O. de Andrade. **Manufatura enxuta, Gemba Kaizen e TRF: uma aplicação prática no setor têxtil.** XXVIII ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO. A integração de cadeias produtivas com a abordagem da manufatura sustentável. Rio de Janeiro, 13 a 16 de outubro de 2008. 13 p.

IMAI, Masaaki. **Kaizen: a estratégia para o sucesso competitivo**. 6ª ed São Paulo: Instituto de Movimentação e Armazenagem de Materiais, 1994.

IMAI, Massaki. **Estratégias e Técnicas do Kaizen no Piso da Fábrica.**Iman, 2000.

ISHIKAWA, K. (1986). ***TQC, Total Quality Control:* Estratégia e Administração da** JHA, S., Michela, J. L., & NOORI, H. (1996*). **The dynamics of continuous improvement International Journal of Quality Science***, vol. 1.

OAKLAND, John S. **Gerenciamento da qualidade total**. 1ª ed. São Paulo: Nobel, 1994. 459p.

ORTIZ, Chris A**. Kaizen e Implementação de Eventos Kaizen.** Bookman, 2012. Qualidade, 2 ª ed. São Paulo: IMC.

PALADINI, E. P. **Qualidade Total na Prática – Implantação e Avaliação de Sistemas de Qualidade Total.** 2ed. São Paulo: Atlas S.A., 1977.217p.

SLACK, N. et al. **Administração da produção.** Trad.: Ailton Bomfim Brandão et al. 1.ed. São Paulo: Atlas, 1996.