

# The Impact of High Performance Equipment on the Efficiency Indicators of Companies

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**Abstract:** *The objective of this research is to analyze the impact of teams high performance in the indicators of efficiency and 5's in order to propose a methodology for implementation in an automotive company. The research is oriented to the development and planning of these teams, making a scheme determined by: priorities, the autonomy of the equipment, the faculty of the same and its responsibility for the resolution of the main problems of a production line (safety, quality and efficiency) but without neglecting the human side support it is on the principles of the company and teamwork .This is not only intended to reaffirm the concepts of the advantages of having and / or participating in high performance teams, but also to serve as a reference framework for companies that are interested in implementing similar methodologies through this proposed route.*

**Keywords:** high performance team, efficiency, 5's, efficiency indicators

## 1. Introduction

The present work intends to develop a plan that facilitates the fulfillment of the company's objectives based on the creation of a multifunctional cell (operation, maintenance, quality and industrial engineering) which will allow to have a greater analysis of the problems, make own decisions, minimize response time, improve communication, achieving a sense of belonging, in addition to facilitating personal and / or professional development and stimulating creativity and innovation.

## 2. Theoretical framework

### High performance teams or autonomous teams

Grupo Kaizen , SA (2009) in the article *self-directed teams* describes the EADs (High Performance Equipment) that are also known as Self-Directed Cells , lately they have been given the name High Performance Equipment, and even *Insects Social* . Self-Directed Teams are a sophisticated form of employee participation, based on the philosophy of *empowerment*, which seeks to move decisions to the lowest possible level of the organization, so that the operational staff makes the decisions that are relevant to their own work and have a wide range of responsibilities

Peers (2008) defines the high-performance team as a group of people who are related through interdependent activities, whose interaction affects the other members and, therefore, sees themselves as a single unit. In addition, for Escat (2009) he is the one who has achieved the proposed objectives in an excellent way in terms of effectiveness and efficiency Hernández (2008), defines a high-performance work team, as a group that share complementary knowledge, skills and experiences and that, committed to a common purpose, set

realistic, challenging goals and an efficient and shared way to achieve them, ensuring timely, predictable and quality results, for which members hold each other accountable.

Holpp (2004) defines a high-performance team as a group of employees with empowerment who have the capacity to make certain decisions about their work, sometimes operating with little supervision and enjoying the authority to perform tasks that were traditionally in the hands of the supervisor. .

On the other hand, Trejo (2009) mentions that high performance teams consist of teams that organize themselves to work and deliver exceptional results given the sum of their strengths and the same internal organization and do not necessarily work more, nor are they smarter than the rest.

In addition, Palomo (2010) defines a high performance or high performance team as a group of people who have complementary talent and skills and who work to achieve a common goal showing a high level of commitment. They interact with each other by accepting certain norms and sharing emotions, participating in a common feeling called team spirit and achieving high performance and excellent results.

### Characteristics and considerations

Hernández (2013) points out that the executives of the organizations authorize and legitimize the high performance teams in order to promote creativity, facilitate the use of various intellectual resources and inspire problem solving and due to the reduction in the size of companies and reengineering, have produced a decrease in the number of managers and administrative levels, executives have chosen to provide workers with greater autonomy and control of

their work, which has increased job satisfaction and consequently, employees have acquired greater responsibility in their work, so these conditions have given way to self-directed teams .

Trejo (2009) points out that typically, a high performance team is formed for a specific reason, and members are often considered the best, these address complex issues that have the potential to produce a significant positive impact on the organization. One of the main challenges for Mexico is the formation of high performance teams. To build them, you must create an environment of trust, leadership, good communication, a clear understanding of the objective to be achieved and the participation of each member and try to make the most of their strengths.

Palomo (2009) considers that there must be 3 basic requirements for the creation of EAD, first that they perceive that they have a common operational objective, but also concrete and attainable, second that they are explicitly identified as team members and perceived as a differentiated unit of In the others, membership is public and known to all and third parties develop formal norms of behavior that regulate relationships and are focused on guaranteeing the achievement of objectives and guaranteeing people's satisfaction and motivation.

For Guízar (2013) he mentions some parameters or considerations to know if the team is prepared to become an EAD, as if: the manager wants the team to assume more responsibilities, the team shares common goals, is willing to learn new skills, works well as a group, sympathize with each other, communication is effective, is able to communicate with people outside the work team, expresses their expectations correctly, their organization is creative, does not fear hard work, believes it is important to set goals He has determination, he is willing to negotiate, they help selflessly, problems are solved, he is willing to do more than he can, he can resolve when the behavior becomes disorganized and the senior manager supports and assists the team's work.

Based on ten mentioned authors and the characteristics established on high performance teams, a comparative chart is developed, showing the mentioned qualities in order to better analyze the written coincidences. In this way the coincidences in more than 5 authors are the following characteristics: have a common objective, trust in the team and members, very good communication, complementary skills and use of strengths, commitment and identity, have incentives and rewards, have specific roles and / or responsibilities (Figure 1)

No.	Características / Autor	Trejo	Palomo	Humbaker	Guízar	Blanchard	Borral	Hawkins	McShane	Robbins	Grupo Kazuo
1	Objetivo en común	X	X	X	X	X		X	X	X	X
2	Confianza en el equipo e integrantes	X		X	X	X	X	X		X	
3	Liderazgo	X								X	
4	Muy buena comunicación	X			X	X		X			
5	Destrezas complementarias, fortalezas y nuevas habilidades	X	X		X			X		X	
6	Normas y reglas específicas		X								
7	Planes de acción propios			X	X						
8	Compromiso, identidad y participación de los miembros	X	X	X	X			X			
9	Valores y propósito					X					
10	Empoderamiento o empowerment					X		X			X
11	Tener, incentivos y recompensas						X		X	X	
12	Tener roles específicos y/o responsabilidades				X		X	X	X	X	X
13	Reducido número de personas				X			X		X	
14	Tener retroalimentación y evaluación de desempeño del equipo							X	X	X	

Figure 1: Characteristics of High Performance Teams and relationship with authors

Source: Author's elaboration based on the mentioned authors

Efficiency and 5's

Efficiency concept and considerations

Chase (2012) mentions that efficiency is to do something at the lowest possible cost, in general terms the goal of an efficient process is to produce a good or provide a service using the least amount of inputs possible. Efficiency means doing the right thing in order to create the maximum possible value for the company. When effectiveness and efficiency are maximized at the same time, conflicts often arise between the two goals. In life, these challenges meet every day. At the customer service counter of a local store or bank, being efficient means using as few people as possible at the counter. However, being effective means minimizing the amount of time customers must wait in line. It refers to the proportion of the actual production of a process in relation to some parameter.

Peter Drucker (1973) mentions that efficiency means doing better all the things that have to be done, while effectiveness implies doing certain things well. Efficiency is concerned with the effort in all areas of activity, efficiency deals with 10 to 15% of the activities that occur from 80 to 90% of the results, the other 85 to 90% of activities only constitute 10 20% of the results: in addition to that, no matter how efficient such non-effective activities are, they only produce costs.

An example mentioned by Fernández (1997) to understand what efficiency is about a football game; as in any other sport, the ultimate goal is to win (efficiency = results) regardless of how it has been played (efficiency), of course if you win and play a good game better than better, playing well you have more chances of winning , but sometimes a good game is played (efficiency = means) and not won (efficiency = objective).

Summers (2006) mentions that the internal goals and processes of the organization, as well as the individual efforts of the staff are intrinsically related to efficiency. A company that increases its efficiency will notice an improvement in its profitability, and it will be easier to retain

customers. Whenever efficient organizations have more focused and agile processes, they will also get the benefit of lower costs.

**The 5's**

Rey (2005) mentions that the 5s is a work program for workshops and offices that consists of developing order / cleaning activities and detecting abnormalities in the workplace, which by their simplicity allow the participation of everyone at the individual / group level , improving the work environment, the safety of people and equipment and productivity. The 5's are five Japanese principles whose names begin with the S and that all go in the direction of getting a clean and tidy factory. Being a Japanese methodology, virtually all authors who talk about it agree on the meaning and application of it.

Cuatrecasas (2012) mentions that the basic activities of a 5s program are five, corresponding to many other words that in Japanese phonetics begins with S. being these (Figure 3)



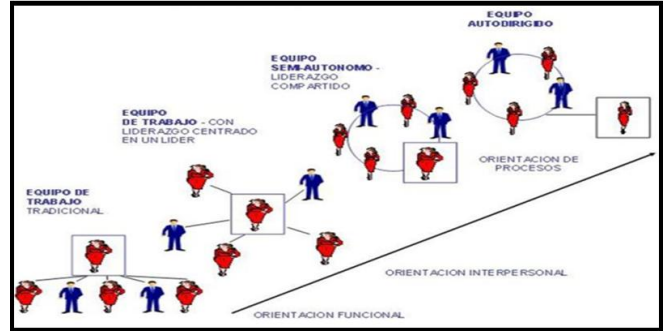
**Figure 3:** 5 'S

Source: Harrison (1992, p. 115)

Harrison (1992) mentions that the first four S's are basic to the excellence of a company, develops pride and motivation using high standards of order and cleanliness and as a good characteristic of the company to be shown to visitors and consumers. There is a progressive logical sequence improving the organization of the work area based on the order and cleaning and conservation thereof.

**3. Methodology**

For the present investigation a qualitative methodology is used, based on the analysis of the perception of the model by both managers and employees, as well as the operability of the implementation and test of the strategy.



**Figure 4:** Stages of implementation of a high performance team

Source: National University of Colombia, Self-Directed Teams (sf, sp). Obtained in January 2015 from

It is imperative that the strategy is cascaded from the management or plant management, to achieve the expected results, otherwise, it will become an isolated and frustrated attempt.

Once the project is accepted, it begins with the planning of activities considering a period of one year. This period is established based on the experiences and knowledge of the implementing leaders. A standard is established for conducting continuous meetings of the team that will help us analyze and solve problems that host the production line. Formats are developed as support for meetings and as support for monitoring objectives and indicators, an information board is designed, presentations are made to show the project to team members, videos about efficient teams are shared in other companies, They conduct interviews with members about their expectations, and the activities are reflected in a Gantt chart, consisting of 4 aspects: 1. General, refers to the aforementioned (formats, meeting standard, information board, information gathering, etc. ); 2. Method, refers to the SWOT analysis of the team, training, roles and responsibilities; 3. Results, refers to the comparison of the main indicators and verification of results and 4. Standardization, refers to the documentation and dissemination of new standards.

**4. Results**

After 5 months of implementation, some of the results shown according to indicators are the following:

With respect to 5's, there is a clear trend towards improvement over last year, even today it is one of the best lines in this regard. The operational staff has been involved in all aspects related to this indicator, improving through the agreements made in meetings, but above all there is a difference in the level of commitment. A then a tendency of 5's shown of the production line, on the vertical axis a percentage, which increased the more than 20% and on the horizontal axis periods in the year is observed (each period corresponding to 4 weeks):

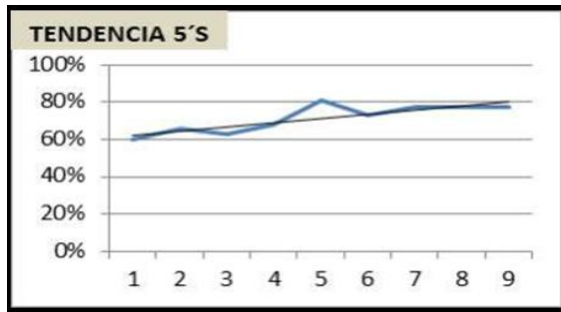


Figure 5: Trend of 5's of line 7

Source: Own elaboration based on results data of 5's

Two aspects that were not considered in the project, but that nevertheless have improved with the start of implementation of high performance teams are the greater number of ideas implemented in the line and the increase in the participation of these, so it can be seen that : Regarding the number of ideas, there is a clear trend towards improvement over the previous year, 3 ideas were made throughout the year, in 2014 (8 months) there are already 18 ideas, which means that there is a greater participation and interest of the group in improving more and more, creating a sense of belonging with respect to its production line. A then a trend of ideas implemented shown the production line, on the vertical axis the number of ideas, and the horizontal axis periods in the year.

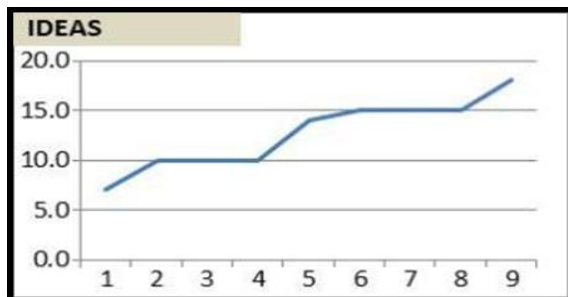


Figure 6: Trend of ideas implemented

Source: Own elaboration based on results of ideas

With respect to the percentage of participation in ideas, there is a clear trend towards improvement over last year, 25% participation was obtained while so far this year there is 55% participation so far registered. A then a trend of percentage interest shown in the production line, on the vertical axis one percentage, and the horizontal axis periods in the year



Figure 7: Percent of participation in ideas

Source: Own elaboration based on results of ideas participation

With regard to efficiency, no improvement is observed. A dead time trend is shown below (which

represents the operation and maintenance effect on the production line), on the vertical axis a percentage of dead time, and on the horizontal axis the periods in the year.

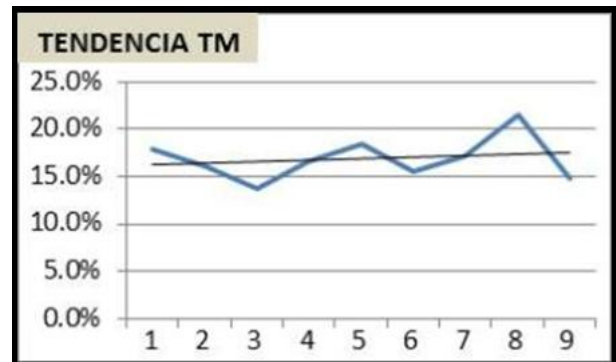
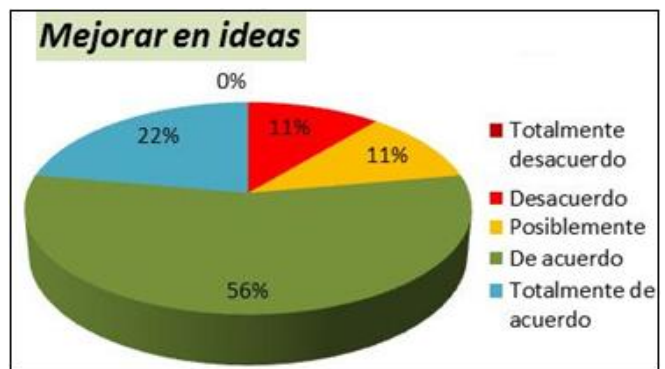


Figure 8: Downtime trend by operation and maintenance

Source: Own elaboration based on data on dead time results

**Results**

In order to detect the perceptions and opinions of the people who make up the high performance team after 6 months of implementation, a survey was developed to analyze the possible advantages from the point of view of the team members as well as the areas of opportunity that will be guide to improve implementation in another production line. For purposes of greater veracity, the surveys were conducted anonymously to 9 people who make up the team so the survey has no name, age or area. The first 5 questions were based on the Likert scale 1. Strongly disagree, 2. Disagree, 3. Possibly, 4. Agree, 5. Strongly agree. The results being the following:





## 5. Conclusions

The first objective of this project was to develop an annual implementation and training plan based on the benchmarking of two companies for which different activities were carried out such as: 1.- A structure to carry out continuous meetings between the different departments that are directly in the production line carried out by operational personnel and as maintenance, industrial engineering and quality support personnel, where the main problems of the production line are analyzed (industrial safety, quality, efficiency or downtime, abnormal conditions and improvements). 2.- An information board was developed for the team to interact with it. 3.- A series of formats that serve as a tool and support for the group, which were designed according to the needs of the equipment and the project implemented (described in detail in Chapter 3 *Methodology*) and 4.- Implementation of a plan of annual action involving in detail all the activities to be carried out by the team and project leader embodied in a Gantt chart as well as the training required for the staff. One of the most important conditions has been the human aspect where it is established as part of the strategy in the meetings to recognize some member (based on the principles of the company) to create and strengthen trust among the members.

The incentives for the group so far were not at any economic time, but simply the gratification of working better and feeling part of a team that solves problems by itself. In addition to the operator feeling heard and supported creates a sense of belonging to their process. The participation of each of the members has been very favorable, solving more than 100 activities in these 5 months registered in a minute format and an electronic file for follow-up.

Based on the results of this work, it is detected that the 5's indicator improves, but in addition there was a greater participation and number of ideas focused on a common

objective, also achieving: a synergy between the different departments mentioned, greater confidence in the team, improvement in the communication of the members, the commitment and the engagement of the employee. In these 5 months of implementation there has been no improvement in the downtime indicator that directly affects efficiency, however this does not mean that it does not bring efficiency benefits simply that it does not bring them in this period of time, it would require a greater evaluation in time to validate the impact in this aspect.

Areas of opportunity in the development of this project are identified as the need to involve managers from different areas with specific assignments such as routes along the line, participate in meetings sporadically but under a specific plan in such a way that the senior team performance detects the interest and participation of headquarters of medium and high levels, and keep in mind that it is a general strategy of the company and that they have their support, obtaining in this way a benefit of gaining satisfaction in the worker and winning in results for the company, which translates into cost reduction by being more efficient, more productive, with less quality errors, etc.

It is important to highlight that the speed of implementation will depend largely on leadership, management support, the characteristics of the members, the maturity of the team and, above all, the company's culture.

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