MSc Program
Engineering Management

The importance of the standardizations processes in the organizations

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Em.O.Univ.Prof. Dipl.-Ing. Dr.techn. Dr.h.c.mult. Peter Kopacek

Edilson Vieira Santos Júnior, MBA, BSc

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Affidavit

I, **EDILSON VIEIRA SANTOS JÚNIOR, MBA, BSC**, hereby declare

1. that I am the sole author of the present Master's Thesis, "THE IMPORTANCE OF THE STANDARDIZATIONS PROCESSES IN THE ORGANIZATIONS", 130 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted the topic of this Master's Thesis or parts of it in any form for assessment as an examination paper, either in Austria or abroad.

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Signature

I. Acknowledgements

I would like to express my gratitude to PhD Peter Kopacek, for his time and guidance in the writing of this master thesis. It was a pleasure having him as my Supervisor and also for having been his student.

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I would like to dedicate this Master Thesis to my country (Brazil), to my continent, South America and also to Austria, which is the country where I've been living since (2019) and that welcomed me so well.

Last but not the least, I would like to dedicate this master thesis to everyone who is interested in Quality Management, who wants to study and improve it more in their routine either study or work and I want to leave those writings to the posterity, because we will someday die, however, our legacy will be eternal in this planet we call Earth.

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II. Abstract

The advancement of technology makes the companies to reinvente themselves quite often, in order to provide increasingly demanding customers. The company may provide a product or a service to a customer million times, however, when the company provides a product / service with defect, they will be always remembered for this issue. It is very hard finding a company which has never commited a mistaken into delivery a product with mistaken to a customer. Most of the time it happens, because the employees are overwhelmed, a department did not understand properly the customer requirements, lack of standards process and many others.

We are already in the 2020's and everyday more and more the business world have stronger competitors. If your company does not provide and delivery the requested product or service on time, be sure that there will be another company which will do it and your business may have serious problems. With the advance of the internet, it's possible to know what the customers wants and how to target them and also the internet it is a tool which may bankrupt with a company. If a customer is not satisfied with which he got, he may put a photo in the social medias and the papers of your company may go down until you have economical problems.

Nevertheless, much of the impacts can be avoided. It depends on the capacity of the company to invest in the Quality Management department to provide the Continuous Improvement in their internal processes. A company without process may fail and once it happens, the competitors will be very happy.

Key words: Quality Management, Continuous Improvement, Process, Customers and Business.

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1. Introduction

"Alea jacta est" (Julius Ceaser)

Since the beginning of the 20th century, the concepts of Quality Management have gained importance to the organizations. This fact is mainly due to the concept of increased revenue, reducing of waste and cost.

Before those first concepts, there are no evidences that worldwide organizations have tried to do something in this direction. Perhaps some have tried, however, maybe in the future through new researches something may be revealed.

Nowadays in the 2020's we are living under a very uncertain moment of the humanity due to this virus called covid19. What do I mean with this sentence? I mean that worldwide companies have already bankrupt, worldwide economy is crashed and nobody know what comes next. Basically that's the same scenario of a century ago, where the humanity passed through the Spanish Flu and also the Crash of New York in 1929, which's known as The Great Depression. Now, more than never, the economists all over the world will have the challenge to establish the economy of their countries.

On the same direction, the companies from now on will have the same challenge, it means, how to survive on this uncertain moment and how to reinvente after all this crisis? Those question that owners, partners and leaderships are trying to figure out how to answer for the near future. More than never, the companies will have to be efficient in order to survive, otherwise, other competitors will gain those customers from those companies which did not delivery the product / service in accordance to the customers requirements.

In Brazil, the country I come from, we have the following sentence when the topic is crisis: "*Crisis is synonymous of change, because during the crisis, more ideas people have, more creativity people are and consequently, more opportunities appears.* (Unknown author).

We have already seen along the centuries that this sentence is completely truth, however, we really hope this one we are living right now does not last too long to end up, since daily more and more people are being fired and the consequence of it can be terrible. And also it's another crisis among many that the capitalist system will have to deal up with. In order words, the economy also needs a Continuous Improvement from time to time.

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1.1 Industrial Revolution

"The Industrial Revolution was another one of those extraordinary jumps forward in the story of civilization". (Stephen Gardiner).

The Industrial Revolution was one of the most important events of the humanity. It started in England somewhere around the 18th century, and few decades later it spread to other countries in Europe and also to the United States. The main idea behind this event was the replacement of artisinal labor to the manufacturing.

Meanwhile a artisinal labor took days, months or even years to produce something, now with the development of the machines more products could be created in a short space of time. And, let's remember something: a artisinal labor will never create something similar more than once, however, a machine has this capacity. So the costs of production were drastically reduced due to this substitution.

Before the Industrial Revolution, many people used to live in the countryside, however, this event brought the migration of those people to the big cities, because the factories and industries settled down in the cities, mainly due to the infrastructure. The consequence of this revolution it was not only economic, but also social. According to the American Economist, Nobel Prize (1995), Robert Lucas Jr: "for the first time in the history, the standard of living of ordinary people began to undergo sustained growth. Nothing remotely like this economic behaviour is mentioned by classical economista, even as a theoretical possibility".

Also before the Industrial Revolution, basically simply machines were used to produce something. And the craftshmen had the complete control of the production since the raw material until the final product. With the Industrial Revolution, those workers lost the total control of the production process, since they started to work for somebody (as employees or workers), so that, they lost the possession of the raw material and the final product. Consequently, the profit. These employees started to work on the machines and those equipments belonged to a particular owner or partners who now started to received all the profit provided by the production of those workers.

The concept of the Industrial Revolution took a while to conquer Europe completely, mainly due to the religious issue among Catholics versus Protestants. So, initially, as mentioned before it started in England, which is a Protestant country, then, other countries and region which had this religion as official were the first to accept this idea: Scotland, Netherlands and Sweden.

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The consequence of the Industrial Revolution to the world in the technological aspect was extremely important, machines were created and developed, also in terms of medicine, chemical and others more. One aspect that was extremely affected was the transportation, because along the years trains and ships moved by coal were developed. So, now, the long distances have been shortned. Also during this period the products have some kind of standards, although nobody had no care about it. The companies simply wanted to produce as much as they could and see their final profit. As the companies, in those times, had no concern about losses, the enviroment resources were extensively exploited without the caution that one day they might lack. Coal, iron, water are just few examples of resources that were used in order to supply those machines and this new life's concept.

In the historic aspects, we have the BC and AD to determinate a period in our calender. On the other hand, in terms of technological aspect the Industrial Revolution, which is also known as Industry 1.0 is the divider of the period that we know as Middle Ages (or Dark Age) for the Englightenment, the age of the ideas, of the industrialization, it means, the modern Capitalist era.

According to the scientists, now we are in the Fourth Industrial Revolution, which's also known as, 4.0 Industry. This is a expression that encompasses some technologies for automation and data Exchange and uses concepts of Cyber-Physical Systems, Internet and Cloud Computing. According to some authors the Industrial Revolution is one of the greatest event of the humanity, as well as the invention of the wheel.

Nevertheless, the first principles of Quality Management, started to get importance that we know nowadays during the Second Industrial Revolution, that happened somewhere between 1850 and ended during the Second World War (1939 – 1945) in the United States, however, it was in the Third Industrial Revolution that the concepts were totally incorporated on the companies, mainly by American who export the concepts to Japan, because this country suffer several consequences during and after the war. And, for economical and political reasons, the USA decided to reconstruct the Japan, in order to have peace with them after the devastation of two nuclear bombs in Hiroshima and Nagasaki.

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1.2 The first principles of Quality

"Any change, even a change for the better is always accompained by drawbacks and discomforts". (Arnald Bennett)

Before talking about the principles of the Quality Management and the evolution along the years, it is very important to know the definition of the word "quality". Quality is a word that comes from Latin *Qualitate* it's related to the perceptions of each individual human being and several aspects, such as culture, product or provided service. Needs and expectations also directly influence in this definition.

Quality can be defined by several aspect, such as: the quality of life of people from a country, quality of water people consume or the air we breath, the quality of the service provided by a company, or quality of a product in general. As the term has several uses, its meaning is not always clear and objective.

We can define quality as requirements. Each customer is unique and each of them has different expectations of a product or service. Please all of them is a humanly impossible task. However, it is necessary the companies create standards in order not to produce something with non conformity, in other words, with defect, because clients dislike defected products.

With the industrial revolution there was a new productive order, in which customization was replaced by standardization and large-scale production. The invention of the machines designed to obtain a large volume of production and a new way of organizing work made it possible to achive mass production (Carvalho and Paladini, 2006).

Along the years the productive process has been modify few times and there reason for that was that the companies were trying to be more competitive in the worlwide market. Before the companies used to prodive their product to the region they were established, since the logistics were precarious, extremely expensive and it used to take to much time to do trades somewhere. Neverthless, with the development of the logistics, mainly: train and ships, which had coal as the fuel, it was possible to made target others worldwide foreign places.

The production system has undergone some change over the years in its production chain. For example, initially the workers had to start and finish the product,

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years later the companies realized it was much more productive to carry out the division of labor. The third step was the quality control inspection, it means, the employees of the Quality Department inspected the materials, parts and componentes in order to verify if they meet the specifications.

Subsequently, one of the most significant step in terms of quality was taken: The Statistical Quality Control. Obviously the other steps mentioned were important to the evolution of the quality, however, how to know if the production is efficcient or not? How much was invested? How much was lost? Thinking in this direction that Walter A. Shewhart (1891 – 1967), develop this methodology while he was working for Bell's laboratory in the year of 1924. At the same time, Dodge and Romind also developed statistical sampling techniques. Those concepts developed by those scientist are used in even nowadays in the 21th century. Fig. 1 show a control chart of a process. On the vertical axe.

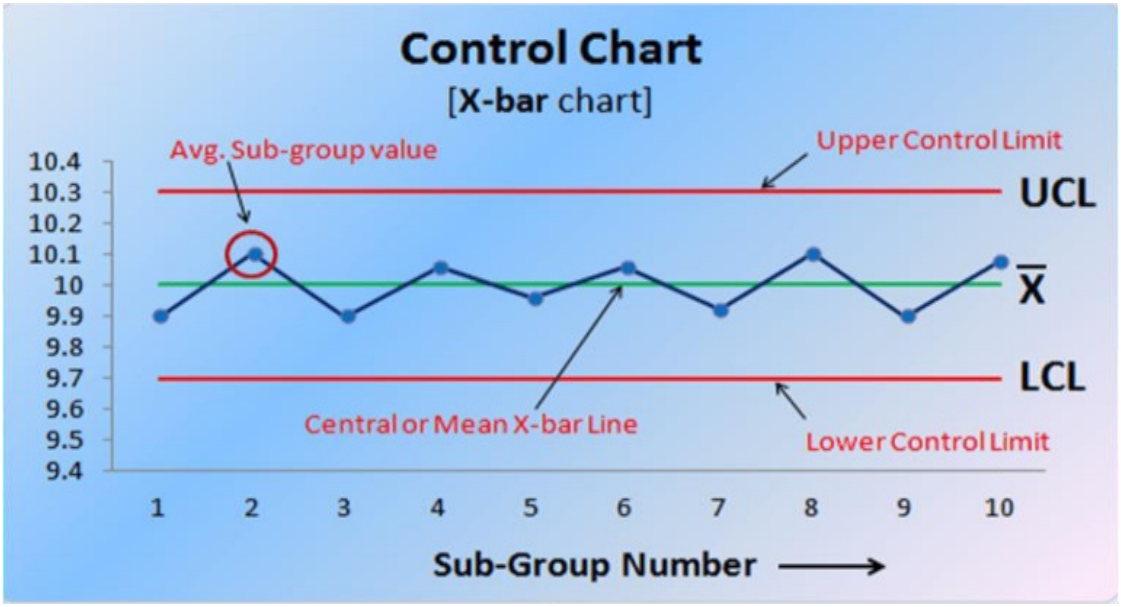

Figure 1: Control Chart or Shewhart diagram.

Source: https://techqualitypedia.com/contro-chart/

Talking a little about this control, there are some variants, such as:

- UCL: Upper Control Limit;
- LCL: Lower Control Limit;
- X: Central Line or Target

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What Shewhart what to propose with this control was: no product will be produced exactly the same way it was done before, even though it's quite similar, because it's produced by a machine, there are many variants which can interfere directly to the conformity of the final product. So, he proposed the company should define acceptance parameters for their products. In Engineering this concept is known as "relative erro" and "standard error". The idea is that the product procuded stay somewhere between UCL and LCL. In case a product does not meet this requirement, then the company has a error and it must be identified the reason, in order not to happen it again.

Before the development of this tool of Quality Control, the companies have no studies to inform how many pieces were produced without conformit, on the other hand, they were not being efficient. Neverthless, we have to remember that in those times, this concept was still something new and basically no-one was worried with those concepts.

Those concepts were no longer taking so seriously, at least, until the beggining of the Second World War (1939 -1945). During this period, it was necessary to produce war weapons with high quality standards. Honestly, in my humble opinion, this is the worst part of quality history, because the concepts were used in order to destroy human beings.

After the war, those concepts of quality gained more importance, mainly in the reconstruction of Japan. Let's remember that the world was divide in two: Capitalist x Socialist. And, in order to keep the pacif island not in the zone of influence of the Soviet Union, the USA government invested million of dollars for the reconstruction of this country and, consequently, many of the gurus of quality have the chance to put in practise all they had in mind. Part of the sucess that Japan had years after the war, with fast economic growth is due to, even if in part, to the quality consultants.

Nowadays the quality concepts isn't only concentrated on factory and their production system, but also includes all departments, such as: supply chain, sales, marketing and others. This concept is known as Total Quality Management. The final sucess of a product or service depends on a good dialogue between the departments. For example, the Sales needs to understand the real customers' requirements, because this information will be provided to the Operation to perform it.

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1.3 The PDCA Cycle

"Love and compassion are necessities, not luxuries. Without them humanity cannot survive". (Dalai Lama)

The PDCA is a method which was developed by Shewhart, but which gained importance through Deming. The idea of the mechanism is to apply the continuous improvement in order to achieve the goals and consequently keep the organization alive.

It is a tool based on repetition, applied successively in the processes looking for the continuous improvement to ensure the achievement of the necessary goals for the survival of a organization. It can be used in any industry, to achieve a better management level everyday. Its main objective is to making a company's management process more agile, clear and objective. This method is widely used in the pursuit of contínuos improvement that is so necessary for business sucess (Geraldo, 2014). Below let's have an idea about this cycle which is so used in quality management system:

Figure 2: PDCA cycle.

Source: https://asq.org/quality-resources/pdca-cycle

As we can see from the figure above, there are 4 (four) steps for rotating this cycle. Below we are going to comment each stage of the process. They are:

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- P (Plan) = before start any activity it is really importante to plan, define the objectives, the goals, the processes, resources, people involved, technology, training the collaborators and others variants. Good planning is crucial to the satisfactory end. The sucess of any activity it will depend on how efficient was planning stage;
- D (Do) = the second stage, of course, after planning the activities is the "do" or as some authors prefere to call "to perform". At this point, everything that was planned must be done;
- C (Check) = the result of the planning and execution will appear in the stage of the process. It means, here the measurement is made in order to understand wether the "P" stage was really well planned or not.
- A (Act) = the last stage is the "A", also known as "act". In this stage, basically is used in case the company, department, etc., didn't achieve the goals according to what was planned.

In case the company was sucessed, basically they will stop on the letter "C", the check or controlling part. And, the results provided from this monitoring will be used in order to make other strategical plans and rotate not only the PDCA cycle, but also, the Continuous Improvement in a company.

Just giving an simple about how to use the PDCA cycle in practise, let's think that a company wants to provide coffee to their employees, because after make a survey withing their collaborators, they realized all of them wanted to have this drink availble. So, in this case, the HR department was in charge to provide this drink. Let's go to the steps:

A) Plan: what to provide?
   - Coffee machine;
   - Coffee beans or and powder:
   - Water;
   - Sugar;
   - Milk.

B) Do: what to do?
   - Provide the drink to the employees;

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C) Check: verify if all collaborators are being attended with the drink and if they are satisfied, through a survey.
    - Yes, all the collaborators are being attended and like the taste of the coffee;
    - Yes, all the collaborators are being attended, however, some of them are complaining about the tasty;
    - Yes, all the collaborators are being attended, however, some of them are complaining about the milk;
    - Yes, all the collaborators are being attended, however, some of them are complaining about the sugar, because some have problems with diabets and need sweetner;
    - Yes, all the collaborators are being attended, however, some of them are complanining that the company should provide something else to eat;
    - No, none of them are satisfied.

D) Act: what to do in case?
    - In case all collaborators are satisfied: just keep doing the same and try to make some significant changes in order to make the employees happier;
    - In case some collaborators are not totally satisfied with something, try to add something that proves the company wants to please them. For example, 2 (two) options of milk: with and without lactose, 2 (two) options of coffee, maybe with and without caffein, for eating: biscuits, bread with cheese, ham, eggs, etc.,
    - In case all the collaboratos are unhappy: it's possible the company, or in this case, the HR department did not plan properly the activities. When a situation like this happens, it's necessary to re-make everything once again.

Of course it's just an example to show that even to make something very simple like providing coffee it's not so easy task as we can think. Now, try to imagine how hard is for a department plan and execute their daily tasks!

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1.4 The 5S

"The greatest hapiness is to know the source of unhapiness" (Dolstoevsky)

The 5S concept was also created in Japan in 1950's after the WWII, with the purpose of helping the country's companies to recover and reorganize themselves during the post-war crisis. Although most of the authors point out that this was an idealization of Ishikawa, there are some controversies about who was the really creator of this technique. It's not objectif of this work diving on this discussion.

Due to the promising results of this concept, 5S has been disseminated since then in several countries. Nowadays, this technique is considered the basis, one of the requirements, for the implementation of TQM.

The term 5S is due to the initial words of each of the senses. Sense it's a words which comes from Latin *"sensu"*, which means discernment, reasoning, attention. Thus, for 5S, sense is the ability to discern and maintain attention on certain points within the organization. Each of the senses has an particular objective and guides in order to provide sollution to correct a mistake. Those are the 5S: Seiri, Seiton, Seiso, Seiketsu and Shitsure. In the Fig. 3 we will see the meaning of each "s".

Figure 3: 5S definition.

Source: https://www.pinterest.com/pin/478859372863517301

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Once known the concepts when can we use them? Imagine a company which's totally disorganized, certainly this organization will never delivere the products on time to the customer. But, not only this, also it affects the employee's productivity, because in addition on being a demotivating factor for the team, it may happen. For example, the employees start working and barely know where their work tools are, lost in the middle of untidy chaos. Likewise, employees barely know from where to start their task and their activities. Also we can mention a workplace with not enough lighting, air circulation and etc. The consequences of it, it'll be: weakness and tiredness to the employees, but also may cause any accident to them or even a product with defect.

The main objective of 5S is to implement a better quality in the workplace, eliminating waste, excessive efforts, problems with hygiene, cleanliness and low productivity. Doing this, the workplace becomes a better place to the employees and consequently it will result in increasing of productivity.

Just like any other Quality Management's concept, the 5S would not be different, since there are several advantages on the implementation of this methodology in a company. And, again, just like other quality concepts, the ideas are quite similar. Below some advatanges of this technique:

- Reduction of costs: a lack of organization obviously brings serious negative impacts due to the waste. Using the 5S wastes will be mitigated thereby avoiding unnecessary costs. Besides that, the 5S enables better management of time and space used by the employees;
- Improving in the quality of products and services: a workplace with enough lightling, we have already seen it's much better for the employees, and it's going to result in the final product. Also we can say about the temperature. If it's too hot in the production line, the employees may be effected by this factor;
- Motivate the employees: everyone wants to work in a place where it brings motivation, right? In order to have better results, it's necessary that the employees are satisfied with the workplace. Motivation is something hard to bring into each person, because each of us is different. However, if the conditions of work good, then, the employees

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are going to work properly. On the other hand, if the leaders are bossy and if there is a negative energy in the workplace, the consequence will affect the final product;

- Security: disorganization and lack of attention are the major causes of accidents at work. Through the 5S and put in practise those concepts the probably of accidents among the employees reduce and make the place safer to work.

It may look obviously to us, however, believe me, most of the companies don't have it. Due to the intensive work, the customer's demand, goals to be achieved and many others, those factors forces, in somehow, the companies not to make internal improvements on theirselves. Companies like that in Brazil we say they are "fire working companies", because they just keep putting out fires all the time, which's in this case, the problems (or attend a demand) and they do not organize themselves to be efficient and profitable.

A good example of companies that put in practise the 5S are the supermarkets. For sure, at least, once in your life you have visited a supermarket to buy things you need. In those places, you can see that there is a kind of organization, because the foods are separated by sector from the drinks, from the fruits / vegetables and etc. If it was not like that but everything is random. First of all you would take too much time to find out what you need. What about if the foods are next to the clean products? It'd be not health! And what about if there were crocroaches, flies and rats in this place? It means it's not clean. And what about if the employees were arrogant to the customers? It'd definitely make you not return to this place again, is that correct? On the contrary, you will be happy to return and for sure you will recommend to your family and friends. Perhaps you have thought about it, but also: bakery, hotel, restaurants, stores, etc., are other examples where we 5S are applied.

When with think about 5S, we could also think about our home. When we wash: the hands, the dishes, our clothes, toilets. When we throw away the trash, when we take out things we don't need anymore, for example, empty bottles of wines or empty can beers or softdrinks. The coffee machine which does not work anymore, the lamps you changed in order to have more light at home. The old clothes you decided to donate, as you decided to buy new clothes, etc., you see? We put in practise the 5S

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at home and, surely, you have never noticed. Probably you just do it, because it became a practise as you were educated like that by your parents.

Some years ago I wrote an article about how this methodology of 5S helped Argentina, Brazil and Uruguay to win the war against Paraguay, in the Paraguay War (1864 – 1870), which is one of the sadest episodes in the history of South American continente. Even though, at the middle of 19th century the concept of 5S did not existo on those times, they were put in practise and the result was the victory. I know it's not the best example, however it's importante mentioning. And unfortunately the article is only avaible in Portuguese language

This concept is just one more among many that exists in terms of Quality Management. The companies use it in order to make their internal processes more effective. There are some companies which does not properly use the name 5S, however, they follow exactly the same principles of this concept. Usually the companies that act like that, they want to say they create something new, which is not true. The basis is the 5S and perhaps they improved it, but it's wrong say they created something that did not exist.

Below in the Fig. 4 let's see an example of a company putting in practise some concepts of 5S that we have already discussed on this thesis:

Figure 4: Example of a application of 5S.

Source: https://totalqualitymanagement.wordpress.com/2010/03/23/some-images-of-5s-houskeeping-in-factories-and-offices/)

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From this Fig. 4 we can notice that this company has the 5S implemented, because the tools and other materials are organized and identified with the name of the screws. So, it will be easier to any employee to perform his activities. And also it will be easier for any new employee who's still not used to the new work routine from the company.

Some companies takes 5S so seriously that they even delegate some employees to make internal audits in order to verifiy if everything is in accordance to what the organization's requirement. It means, someone (or a group of people) will receive a training about this methodology and this person (or group) will be responsible to walk through the workplace areas (the whole company including the offices and not only one specifical area) in order check it out wethere everything is in order or not. And make some notes about what was verified. For example: workplaces are clean, if the tools are held in the correct place and identified, if there is any broken machine, if there is any lamp that needs to be changed, if the employees are using the EPP, and several others. After the observations of this internal auditor, he will be responsible to make report to his Supervisor and to informing about the failures that were detected. Then, this Manager will have to make an appointment with the employees to reinforce about the importance of following the rules of 5S. In some cases more trainings are going to be needed. Also the auditors may not find anything relevent during their inspection in the company. Even when they do not find anything, they must make a report, because they need to describe what were the areas where the inspection took place, what was observed, etc.

Some companies, especially multinational, usually have several employees. So in those organization the 5S used to be bigger than in the other companies. Therefore, those 5S inspections must report, at least, 2 (two) daily non-conformits. It's their objective to do that. In case they do not find anything, they will have their work not well evaluated to their Supervisor. It may look so stricted to do that, right? The reason is: those multionational organization they really want perfectionism. They want to achieve some goals which other organizations don't have. For those it's okay doing a kind of restrict job. On the other hand, it makes no sense at all if you put in practise the same objectives for small organization, since there will be not much non-conformits to be reported and it will make the job of those inspector a little bit boring and monotonous.

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The same principle is used when we talk about any kind of audits, for example, the ISOs (9001, 14001, 45001), there are some parameters informed by the standards or by the company and those inspections must investigate what is or what are not in accordance, report them and the company must correct those failures. We will come back to this topic a little bit later when we talk about nonconformits and ISO 9001. Then will see deeply how is to make a audit in order to obtain results and how to treat those non-conformits. Below in the Fig. 5 there is an example of checklist for 5S audit and we will check it out how it does work.

The 5S technique must be applied and improved in order to obtain better results often. There's no right nor wrong on this technique. Just like any other quality management application, the concept of learning and improvement must be taken into consideration. For those companies which really take this methodology seriously, they are presented with great results provided by the 5S. Likewise, in order to be successed on it, it's important that the Top Leaders accept this methodology and take it also seriously. For those company where the leaders do not take it seriously, consequently, their employee will also not follow the rules and the instructions and the required results will not appear. Mistake of the technique? Of course not, since it has been implemented along the years in the companies and there are cases of success on those where it was take seriously and in consideration by the Top Leaders.

The person who will be in charge of the auditing process of 5S it does not really necessary have to be someone from quality, however, it's important that this collaborator passes through a training in order to know how to identify the mistakes and seek for opportunities of improvement. Unfortunately there is no menu to inform how to do it and in how long you will learn those techniques. Everything will come with the time and the experience will be quickly appeared for those who have done it before.

Below in the Fig 5, we have an example of 5S checklist audit. Of course, it's just a simple template, where the auditor will enumerate in accordance to the observation that he / she observed during the inspection on the workplace. And after have the checklist filled up, usually the company have meeting with the collaborators to inform the results and what are the following strategies to be taken in order to correct those deviations in the process.

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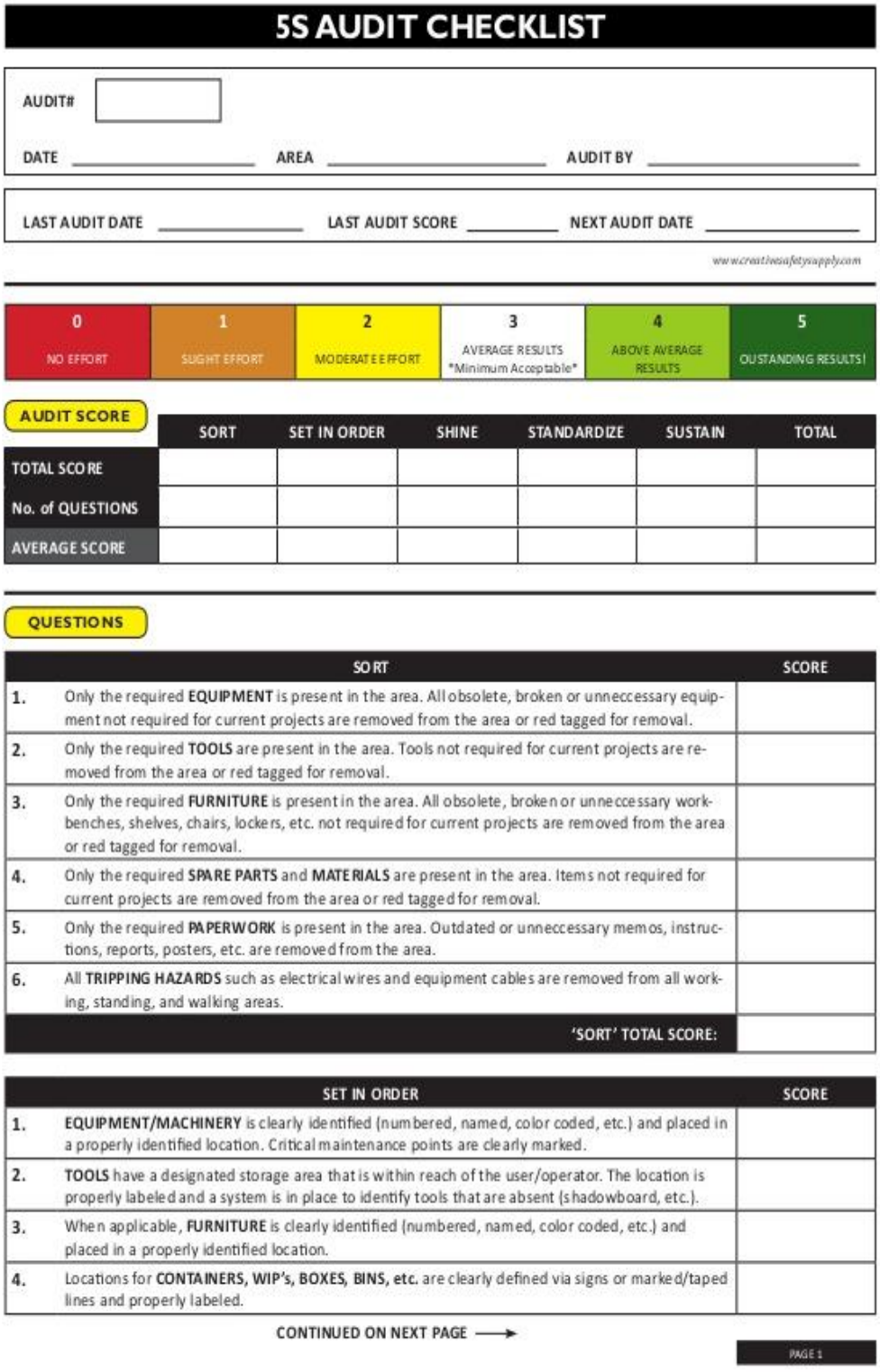

5S AUDIT CHECKLIST

AUDIT# ____

DATE _____ AREA _____ AUDIT BY _____

LAST AUDIT DATE _____ LAST AUDIT SCORE _____ NEXT AUDIT DATE _____

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0	1	2	3	4	5
NO EFFORT	SLIGHT EFFORT	MODERATE EFFORT	AVERAGE RESULTS *Minimum Acceptable*	ABOVE AVERAGE RESULTS	OUTSTANDING RESULTS!

AUDIT SCORE

	SORT	SET IN ORDER	SHINE	STANDARDIZE	SUSTAIN	TOTAL
TOTAL SCORE						
No. of QUESTIONS						
AVERAGE SCORE						

QUESTIONS

	SORT	SCORE
1.	Only the required **EQUIPMENT** is present in the area. All obsolete, broken or unneccessary equipment not required for current projects are removed from the area or red tagged for removal.	
2.	Only the required **TOOLS** are present in the area. Tools not required for current projects are removed from the area or red tagged for removal.	
3.	Only the required **FURNITURE** is present in the area. All obsolete, broken or unneccessary workbenches, shelves, chairs, lockers, etc. not required for current projects are removed from the area or red tagged for removal.	
4.	Only the required **SPARE PARTS** and **MATERIALS** are present in the area. Items not required for current projects are removed from the area or red tagged for removal.	
5.	Only the required **PAPERWORK** is present in the area. Outdated or unneccessary memos, instructions, reports, posters, etc. are removed from the area.	
6.	All **TRIPPING HAZARDS** such as electrical wires and equipment cables are removed from all working, standing, and walking areas.	
	'SORT' TOTAL SCORE:	

	SET IN ORDER	SCORE
1.	**EQUIPMENT/MACHINERY** is clearly identified (numbered, named, color coded, etc.) and placed in a properly identified location. Critical maintenance points are clearly marked.	
2.	**TOOLS** have a designated storage area that is within reach of the user/operator. The location is properly labeled and a system is in place to identify tools that are absent (shadowboard, etc.).	
3.	When applicable, **FURNITURE** is clearly identified (numbered, named, color coded, etc.) and placed in a properly identified location.	
4.	Locations for **CONTAINERS, WIP's, BOXES, BINS, etc.** are clearly defined via signs or marked/taped lines and properly labeled.	

CONTINUED ON NEXT PAGE ⟶

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Figure 5: 5S' Checklist audit.

Source: https://www.slideshare.net/bengeck/5s-sudit-checklist

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1.5 The Seven Tools of Quality

"Without forgiveness, there is no future". (Unknown author).

Managing a company it's definitely a not easy task for any Top Leader. So imagine doing it without any kind of support? It will be harder, isn't that so? As we have already seen from the previous chapters, the first steps of production management were given during the first Industrial Revolution or Industry 1.0. Neverthless, on those times the concepts of quality management were not taken into consideration, and, consequently there were not use of any kind of parameters to control the process. The companies on those times were just focused on selling their products. Certainly the revenue was the only indicator that used to be controlled by the companies.

The Quality Management's concept gained the importance in the business world only at the end of 19th century and begining of 20th. Nevertheless, it was only after the WWII that they finally conquered the importance we know nowadays. And in order to assit those concepts and methodologies some tools were developed to facilitate the life of the Top Leader to manage the company they work for.

Perhaps you are asking why are there Seven Tools? The reason is: the most used are seven. But, it does not mean you cannot use others. Nowadays there are several others we could apply in order to assist in our companies to perform and develop principles of quality, but those one we are going to talk about are the most classical ones. First, let's inform them and then we will comment each othem.

1. Process flow chart
2. Check Sheet
3. Histogram
4. Ishikawa diagram (Fishbone);
5. Pareto diagram (also known as 80-20 graphic);
6. Scatter diagram;
7. Control chart.

- **Process Flow Chart:** the process flow chart is a way used by the companies in order to represent how starts and ends the activities in a department or in the whole company. Through this method it's possible to having an overview about the activities and make improvement when it's needed. Usually they are

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drawed in software through some specifical symbols, where each of them has a specifical meaning. Its main benefit is to be a simple tool, but very effective for controlling, and against failures.

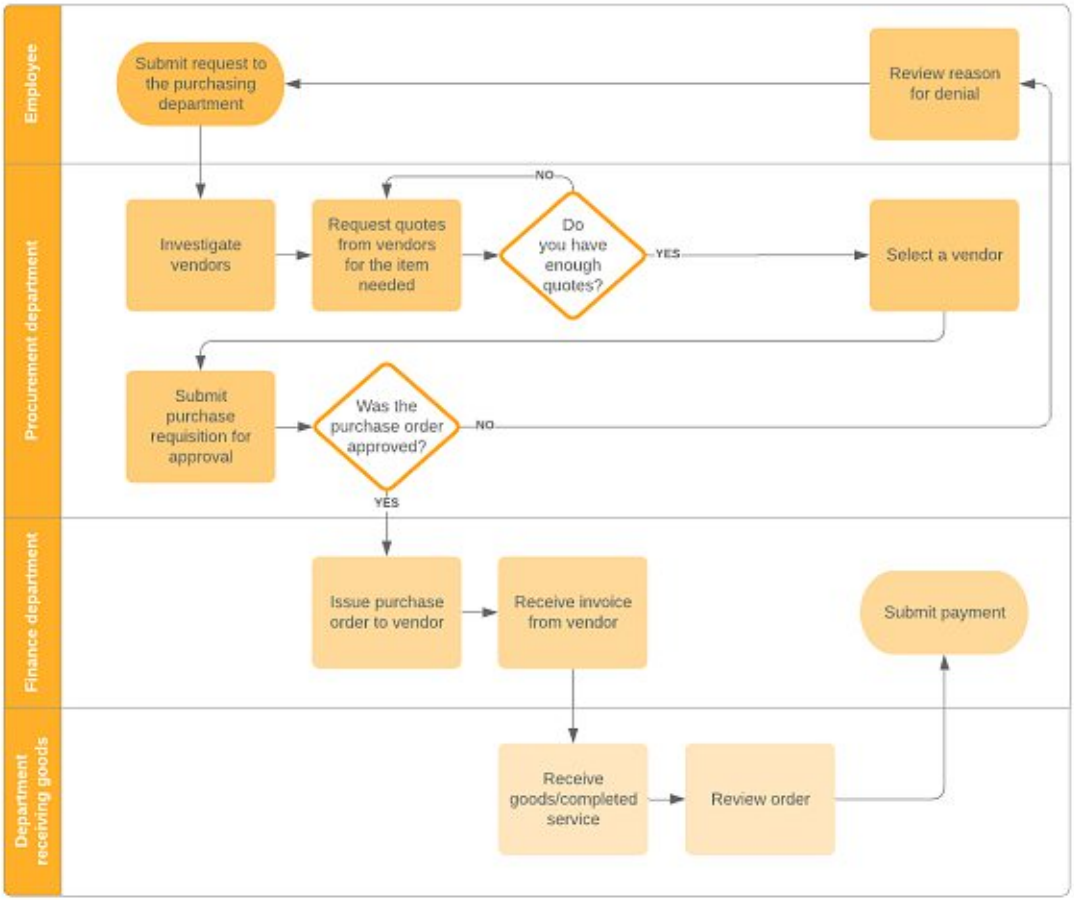

Figure 6: Process Flow Chart.

Source: https://www.lucidchart.com/blog/steps-in-the-procurement-process-flow

This picture above represent an example of a process chart. For those people who are familiar with this diagram, it's easy to understand how it works. On the other hand, for those people who have never seen it before, it's easy to understand after taking a look for a couple of minutes. It's not so complex, once there is a begin and end and some symbles are used. Nevertheless, symbols are used to create this diagram, where the spheres representes the begining and end, rectangles decisions to be made and square the process itself. Later on we will see in practise how this tools is essential for a company and how to map the process.

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- **Check sheet:** this tool is used to collect data which will allow you to analyze a process or problems. The companies use these templates to quantify defects, process volume, cycle times, etc. Usually in small organization forms are used by employees in order to collect the information and those informations will supply spreadsheet, which will have an overview about what can be improved. Below in the picture a example of the using of this tool in practise by a organization.

CHECK SHEET – COMPUTER RELATED PROBLEMS						
S. NO.	Problem	Weekly Status				Total
		1	2	3	4	
1	Network problem	𝍸	𝍸 𝍸	𝍸	𝍸	16
2	Server Problem	𝍸	𝍸	𝍸	𝍸	13
3	Email	𝍸	𝍸	𝍸	𝍸	18
4	Server Access	𝍸	𝍸	𝍸	𝍸	17
Total		10	20	13	21	

Figure 7: Check Sheet.

Source: https://techqualitypedia.com/check-sheet-tally-sheet/

It's important saying that Check Sheet is not the same as Check List. The Check List is the tool which the employees are going to collect the informations. And, once having those informations, they will be reported into a Check Sheet. In other words, one is the complement of the other, however, they are not the same thing. Both are essential, but the have different functions.

- **Histogram:** histogram also known as frequency distribution, is the graphical representation in columns or bars of a previously tabulated data set and divided into uniform or non-uniform classes. The base of each rectangle represents a class. The heigh of each rectangle represents the amount or absolute frequency

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with which the class value occurs in the data set for uniform classes or the frequency density for non-uniform classes.

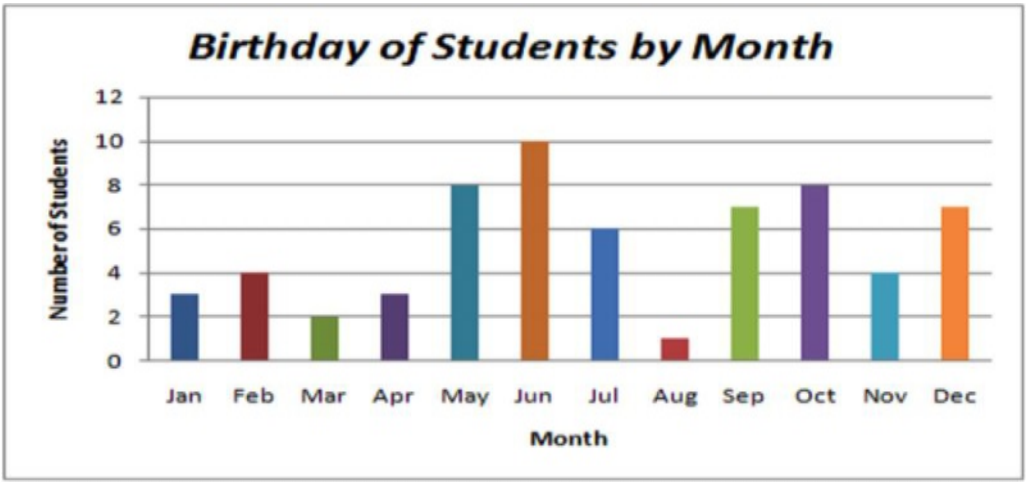

Figure 8: Histogram.

Source: https://dlpng.com/png/427577

This diagram in Fig. 8 is a representation of a histogram, where there is a comparative among the months versus number of students birthdays. Through this information it's possible verify that the great part of the student were born between May until December, with exceptions for the months of August and November. The first four months of the year (January until April), there are not many students who have been born.

The same principle is used by the companies in order to identify gaps of production in seasonal products. For example, for those company who produces ice cream, it's irrelevante to have the same level of production in winter as they have in summer and the reason is obvious. Another example would be a company which produces air condition. If they produce too much of their products in winter times, surely they will have too much production in stock, because not many people will buy those products as they don't need for that season. Of course some people will buy it, once the prices usually are lower in comparision to summer. There are several others examples which could be worked.

Thus, through this tool we could realize it's much more than just some bar graphys, isn't that so? So everytime you realize a company informed something just like: "we increased the sales in 10% in comparision to the last year". It means that they probably used a tool like a histogram (maybe they can use other methods as well, but

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the principle will be the same) and they will make any kind comparasion, which can be: month by month, semester by semester or year by year, etc. It will depend on the stragegy adopted by the company.

- **Ishikawa diagram:** the Ishikawa diagram, also known as Fishbone diagram or Cause and Effect diagram, it was developed by Kaoru Ishikawa. This tool whose purpose is to organize the reasoning in discussions of a priority problem, in different processes, especially in industrial production. The diagram was developed with the aim of representing the relationship between an "effect" and its possible "causes. This technique is used to discover, organize and summarize a group's knowledge about the possible causes that contribute to a given effect. In its structure, the probably causes of the problem (effects) can be classified as being of six different types. They are:
    A) Method: the method that was being performed of the activity;
    B) Material: the material used to perform the activity
    C) People: any causes that involves an employee atitude;
    D) Machine: any cause involving the machines used by the company;
    E) Measurement: every cause that involves the measurement instruments, their calibration, the effectiveness of indicators in showing the variations in the result, if the monitoring is being carried out, if it occurs at the necessary frequency, etc;
    F) Enviroment: every causes that involves the enviroment itself (e.g: pollution, heat, dust, etc) and the working enviroment (layout, lack of space, inadequate dimensioning of equipment, etc).

The main challenge behind using this technique is due to the complexity. As many people are not familiar to it, it takes time for them to understand the real purpose behind this methodology. Of course if you are creating this graphic only for yourself or even presenting for those people who understand this principle, it's totally fine. However, if you appear with a "fish" draw in during a meeting with Top Leaders they will probably not understand the meaning of it and you may be criticise for it. Then, the best practise says that before you make a presentation of it to any person who's not

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familiar, explain the history behind, the benefits from this technique and conclude how you got those results.

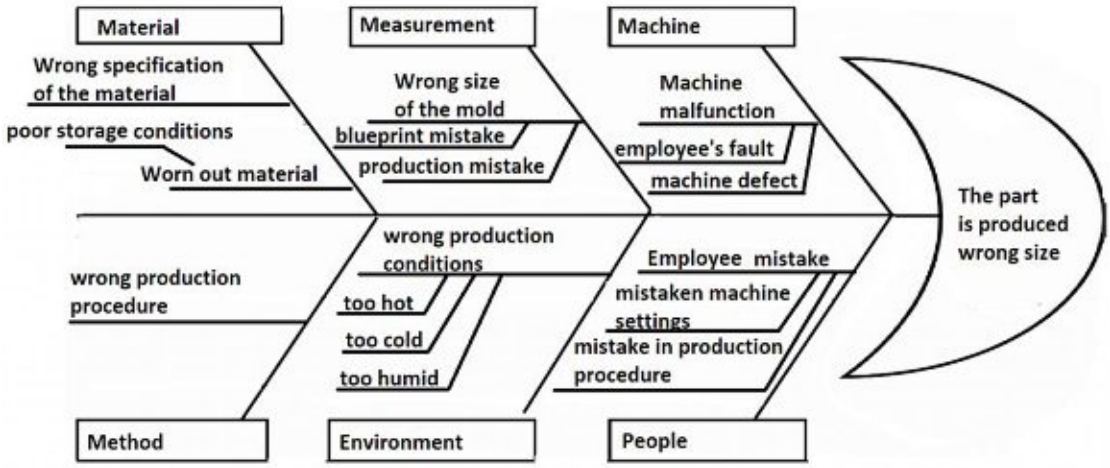

Figure 9: Ishikawa or Fish Bone Diagram.
Source: https://www.leansixsigmadefinition.com/glossary/fishbone-diagram/

The Fig. 9 above we have an example of Ishikawa diagram (or Fishbone), once it really looks like the draw of a fish. Where it would be the head of the fish, it's described the main problem, which's the effect. And the other six parts are the causes. And there are no limits for each sub process in the causes. It can described as much as you observed. Nevertheless, it's better focus in the main causes. Otherwise it can be transformed in a giant problem so difficult to be worked at and so hard to provide a sollution.

This is just one more example of the seven tools that are usually used by the companies in order to identify the problems and correct them. Hardly you will see any company using this methodology, unless it will be used by a specialist, because although it seems to be not too complex, many people are not familiar with this tool and they do not know how to use it.

- **Pareto diagram:** the Pareto diagram is a quality tool which was developed by the Italian Vilfredo Pareto. It became more worldwide known when Juran, one of the Gurus of Quality used it. Through this diagram, an individual selects several items or factors, according to the order of importance. This diagram is

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constructed based on a source of data searches or on the check sheet to detect the problems. It's based on the pareto principle or 80/20 rule which mean that 80% of problems are caused by 20% of the causes, it means, there are few causes that originate most problems. The graphs show the order of priorities that a Manager or Top Leader should use in order to resolve the causes.

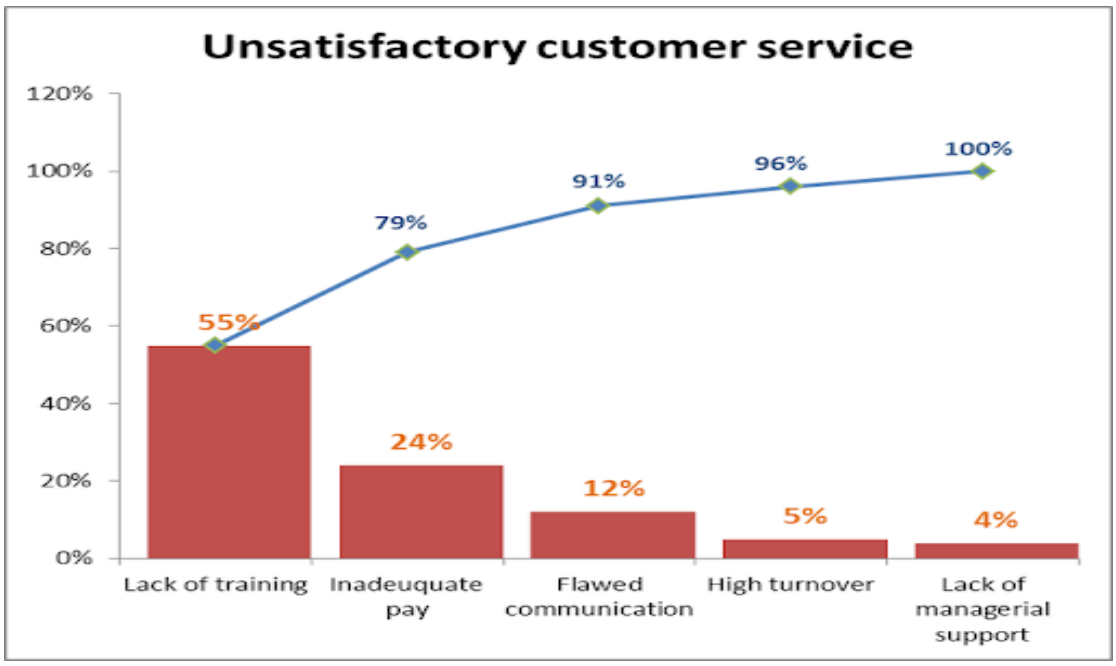

Figure 10: Pareto diagram.

Source: http://www.pareto-chart.com

The picture above in the Fig. 10 represents a Pareto Diagram, where the focus of this problem is the "unsatisfactory customer service". Those red bars are the main problems that the company identified through their survey. Thus, Lack of Training and Inadequate Pay are the mistakes where the company must focus their attention in order to correct it, since they both together have accumulate percentage of 79%, it means, the main focus of the problems is there. On the other hand, the other failures together have 21% accumulated. Of course they need to receive a treatment, but they can wait a little bit, once there are not so critical like the first options. It's obviously, that the calculation does really need to be exactly 80% and 20%, it's just a parameter used by this technique. If the result obtained reaches at 83% and 17% it's also correct. Some authors also like saying that it can be considered the percentage of 70/30. The idea behind will always be exactly the same. It does not matter how you use it: 80/20 or

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70/30, what is really important in this tool that you focus in the main founded problems.

- **Scatter diagram:** are data representation of two classes or more variables that are organized in a graph. The scatterplot uses Cartesian coordinates to display values from a data set. This is also an example of those tools that are used by specialits, once they are not so common for those people who have not knowledge Mathematic language.

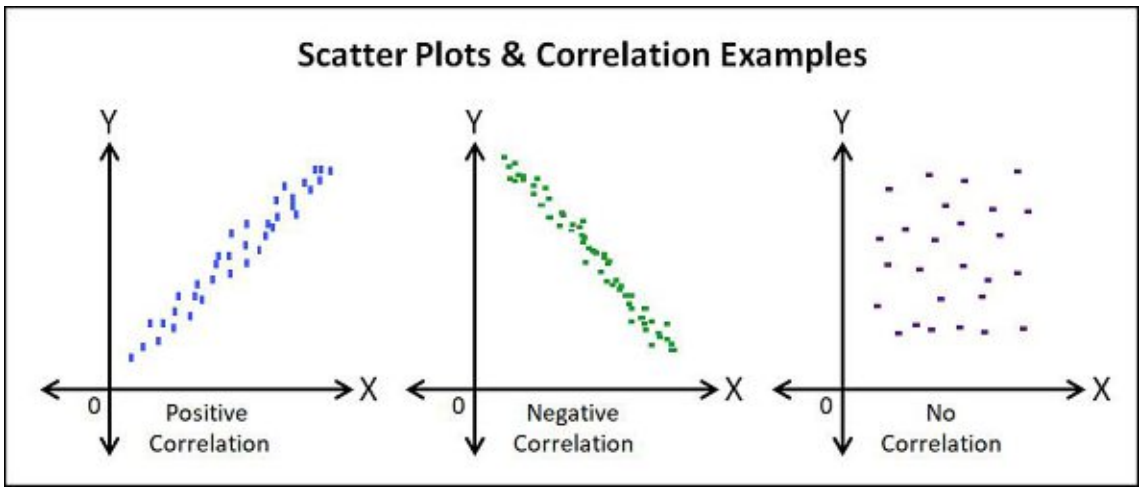

Figure 11: Scatter diagram.
Source:http://www.cqeacademy.com/cqe-body-of-knowledge/continuous improvement/quality-control-tools/the-scatter-plot-linear-regression

Those 3 (three) example explains the real meaning behind this tool. Basically the if the points are increasing it means it's positive and on the other hand it's not. And If there are points, but they are everywhere it means there is no correlation. The same it would be in a case where there would other kind of points, for example, formating a "u" or "c", it would also mean there is no correlation.

- **Control Chart:** it's a type of graph commonly used for monitoring a process. It determinates a range called the control limits by the upper line (upper control limit) and a lower line (lower control limit) and a middle line of the process (central limit), which were statistically determinated. Once it was already explained in the previous chapters "principles of quality", it would be irrelevante explain it again neither included a new example to explain this tool.

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Thus, those are the Seven Tools of Quality. Obviously it was an overview from those methods and it was not deeply explained how to use them in practise or neither how to create them from the zero stage, since that is not the main idea of this thesis doing that and it would take too much time to explain it. The idea was just mentioning which are they and how the companies use them in order to correct failures in their internal or external processes. Surely if you work in company, perhaps you have already seen many other tools. They are useful as well. Those one that were showed are the classical ones forming the Sevel Tools of Quality.

Probably you are asking which one is the best to use in a company. There is no answer to this question, since there is not the best one. It will depend on what the organization really wants, because although they have the same purpose, which is, identify the mistakes, not many people are used to them. Imagine you are in a conference with the Top Leaders of your company and you explain about the 80/20 diagram of Pareto. Probably almost of them will not understand a word about what you are talking about, unless you explain to them how "to read" this diagram. Doing that people will understand what are the meaning behind those words and numbers. Most of the people are more familiar to diagrams like Histogram, because they have learnt at Mathematics class at school or university, at least, once in their life. But, the other tools, only people who had previous experience with it, they will know what you mean. So, if I could suggest something, I would suggest start by the Process Flow, because it's a easy tool to be understood at the first sight and easy to prepare.

Once you have explained your department or even your Top Leaders about the Process Chart, then, it's time to put in practise the other Sevel Tools of Quality. Likewise, the employee will get use to the concepts and it will be easier for them to understand the other techniques. On the other hand, if you try to introduce to them all those concepts at once, there will be a great chance that they will not understand clearly the real purpose of each of them. So, it's up to you (and also to the company), to decide how to apply those concepts. Nevertheless, remember that the tools will not do miracles by itself. It's needed to have a critical analyses in order to identify the mistakes to bring opportunities, in this case, improvements to the organization.

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1.6 The 6 Sigma (6σ)

"Humanity is na ocean: if a few drops of the ocean are dirty, the ocean does not become dirty". (Mahatma Gandhi)

The Six Sigma is a structured methodology that improves quality through the continuous improvement of the processes involved in the production of a manufactured product or in a service, taking into account all the important aspeects in the continuous improvement of the process (Rotondaro *et al*, 2002).

The word sigma is a Greek letter "σ" and statistically it's used to represent the standard deviation of a sample. The sigma explains how much variation there is between data for a sample of population, as can be seen in the normal distribution curve in the below in the Fig. 12.

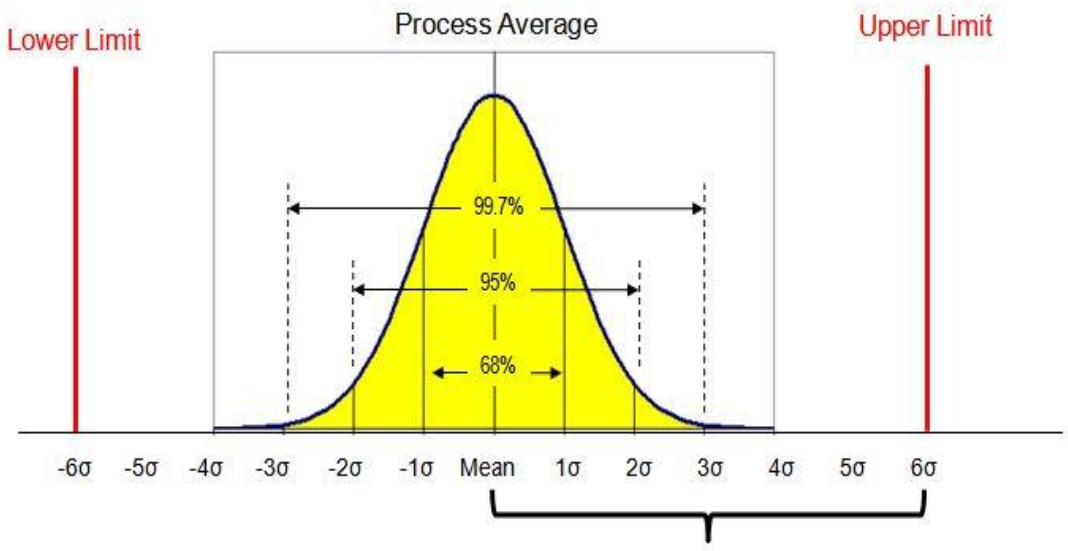

Figure 12: Variation of each sigma.

Source: https://www.leansixsigmadefinition.com/glossary/six-sigma/

The Six Sigma methodology is set of practises developed that aim to maximize the performance of internal processes within an organization and, thus, eliminating defects and nonconformities according to the factory's specification. It's therefore a tool or a concept that looks for the zero defect.

The main focus of this methodology is customer satisfaction through the reduction of defects in the processes and an excelente performance of the organization.

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It may be considered a planned management strategy, which focuses on results in improving the competitiveness of processes. For doing that, be prepare to do math and reap the results in the medium and long term.

In practical terms, the organization that develop the 6 Sigma they have as objective achieve the goal, which is 3,4 deffects for each 1x10^6 (also known as 1 million) opportunities, however they assume that in any moment the organization may fail during the process. From the picture below, we can have an overall understand about how each of the sigmas interfers in the process.

Sigma Level	Defects per Million	Yield
6	3.4	99.99966%
5	230	99.977%
4	6,210	99.38%
3	66,800	93.32%
2	308,000	69.15%
1	690,000	30.85%

Figure 13: Defects per sigma.

Source: https://www.leansixsigmadefinition.com/glossary/six-sigma/

From this above table we can have an idea about the numbers when they are put in practise. As we have already seen Shewhart was the first person to start thinking about monitoring the process. At his his time, the maximum level he could reach making the improvements was 4 Sigma, which on those times, it was considered like a miracle in the business world. It means, for each 1 million times the company was manufacturing a product, 6,210 of them would come with some kind of defect.

Aguiar (2002) believes that the Six Sigma promotes a change in the culture of a company, since its implementation it modifies the company's position in relation to its problems, and also in the way of identifying and treating them.

This methodology was developed in the 1980's by Motorola company. By that time, this company was trying to be more competitive even in the internal market

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(USA) as abroad. After several ways on monitoring the process, they realize too many nonconformits (or defects) were occuring in the manufacturing of their products. Those mistakes presented by the company could, in some point, take them into bankrupt and consequently, their competitors would conquer the empty space which would be left.

The top managers of Motorola, which on that time was leaded by the CEO Bob Garvin, established that the organization should achieve a level of quality from the order 3 ppm, it means, 3 defects for each one million opportunities that were produced. The programm was quite long and had a deadline of 5 (five) years to be concluded and start providing good results. Its objective was to bring together all the existing areas within the corporation and, to make sure that their products did not come with defects anda t the same time had low cost, which is basically a concept of modern companies. And according to Motorola this programm was concluded not in 5, but in 4 years.

Although it has been created on Motorola, it was through General Electric, that this methodology gained the importance we know nowadays and became worldwide known. The GE, which was a company led by the ex- CEO, Jack Welch, turned public the benefits of this methodology. According to himself: “the big mistake is to assume that 6 Sigma delas with quality control and statistical formulas. That is part of it, but it is not just that. It goes far beyond. Ultimately, it drives the improvement of leadership by providing tools for thinkgin about specific issues. At the heart of 6 Sigma, an idea capable of turning a company inside out is stirring, shifiting the organization’s focus away from itself and converging it on the customers”.

Once this methodology was disclosed by someone worldwide known as Jack Welch, many other companies became interested to understand what was the meaning behind this tools and how they could apply for their company. It’s important to mention that in the initial times, 6 Sigma was only concentrated into giant companies. Along the years, more specifical, after 1996 when Welch make it public, it became more popular among the other size companies.

Some people went further in their analyses and informing that if it was not for a programm like Six Sigma, probably giant companies we know nowadays just like GE, Motorola and others would have been bankrupted. Definitely the 1980’s was the decade of changes. If some people were a bit pessmist, I went further on this topic, because some years ago I wrote na article saying that if it was not for a tool like Six

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Sigma, probably the worldwide economy would have crashed just like in the 1929. Also in this decade, Mcdonald's almost worldwide bankrupt, because the profit of this company was almost the same. And then they inovated through a marketing campaign, where they created the jingle of Bic Mac and saved this trade.

When this methodology was created, initially it was created to be used in the manufacturing process, however, nowadays it's not only focused on it, but it can also be applied to any others departments.

Those organizations which decide to adopt the Six Sigma methodology in their processes, they are invisting time and money in a path towards excellence. The objective is to reach the lowest level of defects and the using of those techniques contribute to make it comes true. Below some advantages about adopting the Six Sigma:

- Improving the internal processes;
- Cost reduction, through eliminating wastes or poor processes;
- Elimination of the nonconformits (known as defects);
- Improvement of the services;
- Real customer's focus.

The Six Sigma is just like any other quality management program. However, for this methodology is not used the PDCA, but another one which's so similar. This methodology is the DMAIC and the principles are look alike. Nevertheless, each stage has its own specifications.

- Define: this is the first stage of the project. On this stage the specialists are going to establish the problems and the goals to be achieved;
- Measure: measure the main causes and the effect. Usually at this stage is used the Pareto Diagram;
- Analyse: data analysis and mapping to identify the root causes of defects and opporunities for improvement;
- Improvement: improve and optimize the process based on data analysis using techniques such as design of experiments, poka-yoke and standardize the work to create a new process state. Run process pilots to establish capabilities;

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- Control: control the future state of the process to ensure that any deviations from the objective are corrected before they become defects.

All people involved with the Six Sigma project and especially the leadership, must be commited to using new tools and must be able to learn new methods in order to creating a new type of organization.

Likewise any quality program, the company's leadership participation is important to the success of the programm. According to Deming (1982) "the administration needs to understand that, from now on, the main responsability is for itself, to improve the system". For that reasons, it must be together with those involved to actively participate in improvement projects. It means, it's not enough to participate in the project, but, at least, to commit it.

The specialist involved in the Six Sigma programm are represented by the word "belt" and just like in the karate fight, where each person has an specifical colour in order to identify which level the person is, the same principle also happens in the 6 Sigma structure. It's a little bit different of Project Management projects, where usually the employees are known by their position, for example, Project Manager, Project Assistant, etc. Below in the Fig. 14, the levels of 6 Sigma structure.

Figure 14: Categories of belts.

Source: https://www.six-sigma-material.com

Unfortunately this programm is too expensive to be implemented in a organization, it requires a significant investiment in order to be applied. Luckily it's not only focus on big companies anymore, just like it was once. Nevertheless, for those

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that pretend to implement this methodology needs to be ready and not only apply because their competitors is doing, because if they have this mentality, they will waist too much money and time for anything.

Daily the 6 Sigma concept is gain more and more adepts. Nowadays for those people who are seeking for job opportunities in the quality department, they will face that the organization are requiring employees who have, at least, the Green Belt, which would be the minimum level of this concept. Having this certification it will be enough to understand how to search for opportunities. On the other hand, if the employee has the certification of Black Belt, then, you are more than ready to occupy any position in terms of Quality Management or even Assurance, once you have enough knowledge about how to conduct auditing, inspections, training and, the most significant part to any organization: how to eliminate the wastes and transform those waste on opportunities, which means, money or profit in most of the cases.

Why is this concept so importante nowadays? The answer is simple: that is the most complex and efficient method of quality that has been created in the last years and any other is so good as this one. In practise 6 Sigma is nothing more than the joining of many quality programs using statistical methods. Again we observe that in terms of quality management we will always observe the continuous improvement.

The conclusion of this chapter is that we can considere the Six Sigma as one of the most significants quality programms that has ever been developed. Until the present moment (2021) there is any other which reaches so close to the perfection like this one did. In the following years maybe the specialists are going to develop new techniques and new technologies which could overtake 6 Sigma and becomes it obsolete, however, we will always remember, for sure, that Six Sigma was able to save the worldwide economy from a economic colapse. Nowadays it's the most popular quality programm among the companies and, there is no doubt, in the 21th century the companies will require more and more employees who are specialists as "belts" to occupy positions and make investigations in order to be more efficient and competitive.

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2. Management Challenges

"Everybody thinks of changing humanity and nobody thinks of change himself" (Leon Tolstoy).

Managing a company it's definitely a not very easy task to any human being. There are several challenges involved on it, since the leaders must deal up with: customers, competitors, peoples (their internal employee), technology and take the right decisions in order to guide the company and make it profitable each single day.

Most people tend to think that being a Director, President or even a Manager has a good life just because they are in a leadership positions and their salary is huge compared to the rest of the employees. Do you really think it's so easy like that just because of the salary? In part it's true. On the other hand, we have to remember that they are in positions of leaders and they need to do their best, finding good strategies in order to keep the company working and bring profits to the stakeholders. Otherwise they also can be fired. Probably you have heard few cases of leaders who were fired, right? Although it's not so common practise, it happens from time to time, especially in big companies, where the stakeholders always requires more and more efficience from their subordinates. They invest in a business and they require return of the investiment, or ROI just like the people who works with finances usually refers to this sentence.

The leaders needs to deal up with people and we know, it's not so easy task, because each person is unique in many aspects having: different oppinions, age, mentality, necessities, etc., and how to deal up with it? Sometimes neither among families, friends or relationships we agree all the time and have ours ups and downs. So, what to say about people who work with you? Of course in most of the cases company have the supportal of HR, which usually is composed by employees who are graduated in Psychology and those professional may help the leaders in this difficult task.

Also they need to deal up with the high pressure of his / her bosses who are never satisfied with the results presented by their team and they are always looking for the perfection. Then, those leaders must be creative and look for new strategies in order to achieve this perfection. They also, in some cases, need to think about recruit new employees, buying new machine and suggest new investiments. However, in most of

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the cases they receive the following answer from the stakeholders: " unfortunatelly we don't have more budget. Try to use all what you have".

Due to this high pressure those leaders usually suffer a lot, most of them are only able to sleep through the black strip medicine, just like soothing, antidepressant medicines, etc., because you can imagine how hard is to reach in the management position. And now imagine how hard it will be to find another job where they could receive, at least, an equivalent salary they used to earn in their previous company? It's very hard, no? So, next time, don't say nor think that a leader from a company has a good life, just because of the position and the salary they receive. Take those words with you try to make a reflection on it.

Thus, next time you see your leaders not in a good mood, don't think they are rude, because they are probably not. They are probably not sleeping properly and also they are thinking about new strategies to the company in order to make it more effiecient, once their leaders are requiring more and more from them. It's not easy task as we have already seen and constantly technology and new concepts are passing through continuous improvement and they must be ready for those challenges as well.

If you think being a leader is easy just because this person delegate orders, you are completely wrong about your thoughts, once they do not only do it. And now perhaps you opened up your mind and give me importance about your leaders tasks. So would you really want to be a leader? Are you ready for such challenge or do you think you are not too ready for that? Think about an answer and reflect on it.

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2.1 Manager: Boss x Leader

"The world will not accept dictatorship or domination" (Gorbatchev).

Now that we know a little bit of Quality concepts and the challenges about managing a company, it's time to mention one of the most relevants topic for any organization, it means, the leadership. Many people have a Boss and many others have Leaders. It may sound the same for many people, but there are several different among them and surely neither you have never noticed nor thought about it. In advance, we can say that although they are similar and, in a way, connected, they are definitely not the same.

From the above chapter we saw that it's not a easy task to be someone responsible for a department or even for the whole organization, because there are many responsabilities and pressures involved. Thus, they are needed and they must report to his / superiors about the results delivered by the team. Also they have the power to fire people when they are not providing results.

For several years, or better say, centuries, the figure of the boss has been seen as the person who was responsible to bring the orders, who was agressive and who did not think at all about their employees. And in this past many companies used to appreciate those kind of people, because everyone would fear them. And doing this, the employees would be obedient and would do whatever those boss requires, once they would be afraid to lose their jobs. Nowadays we know that this concept is too old-fashioned. Unfortunately some companies still keep on using this fear strategy, which is a serious mistaken. Fortunately there are new generations with new ideas and different concepts, which does not agree with this mentality and day-by-day the try to correct the mistakes from those conservative organizations. And the generation is not only concentrated on the employees, but also in the learderships.

On the other hand, a leader is completely different from a boss in several aspects. For example, meanwhile a boss says to the employee: "do it now", a leader would say: "let's do it". A company will just achieve their goals and be successed, in case they have great leaders and not bosses to manage them. For the best formance of a company, everyone should be in the same wavelength, where each department is responsible to perform its task and then the result will come. The below picture respresents exactly the main differences between those professionals:

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Figure 15: Leader x Boss.

Source: https://pngio.com/PNG/a129587-boss-vs-leader-png.html

The Fig.15 represents exactly what was already mentioned before. In this first, the leader is in front of his team helping their team in order to achieve the goal. And in the second, we can see the boss is only giving orders to his team. Surely the leader must be in the front of his, since when the employees realize their leader is contribute, they will be motivated to work. On the other hand, for those companies who have bosses, you can see that the boss got the prize and wants distance from his employees, because in his mind, they were successed just because of the strategies he delegated to his team.

The concept of boss has been decreasing a lot in the last years and, in part, it's due to the new generations who did not accept someone being aggressive telling them what to do. On the other hand, the bosses who have those attitudes usually they belong to other generations and, in somehow, it was quite normal to shout with their subordinates, as many of them had this in their youth. So they believe now it's time to them to do the same with their team. So, the authority is one of the main topics that distinguish a boss of a real leader.

Now, let's see some differences among them and then comment those stages:

1. Authority;
2. Decision making;

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3. Negotiation with the employees;
4. Tasks delegation;
5. Transmission of information;
6. The way you see the substitute.

- **Authority**: to a boss, he will use his position to bring fear to his team and because of that, he has the control above his team. The employees usually are obediente, because they are afraid to be fired or even to be punished somehow like not beingp promoted or rise of salary. For a leader, it's completely different, because they use their influence and led their employees in a positive way, always giving attention to them and giving them opportunity to express their oppinion;
- **Decision making**: it's more than obviously that in this aspect for a boss he will decide alone and no-one will try to contradict him, because everyone will think he knows what he is doing, or again, people will be afraid to lose their jobs. For a leader, of course, the final word will belong to him / her. Nevetheless, he / she will explain the reasons behind this decision and how it can contribute for the company and also for the team itself.
- **Negotiation**: for the boss, there is no negoatiation at all. He is the boss, he gives the orders and if you are not satisfied, you are out, it means, you are fired or punished. On the other hand, for a leader, this professional will listen to the employees and will try to find out ways sollution in order to negoatiate wit them where both sides becomes satisfied. Doing that, the employee will feel themselves motivated, since they were listened and had their exigences accepted;
- **Tasks delegation**: for a boss, usually he wants to know what every single employee is doing and doesn't delegate tasks to anyone, because he's afraid someone has more knowledge than himself. And when he decides to delegate some task, it will be only in the theory, once he will be all the time checking out what they are doing in order not to lose the power control of his employees. For a leader, he delegates tasks to his employees and usually trusts on them. What does it mean? It means the leader teaches how to do a task, or in some

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cases, the employee shows enough capacity to perform their tasks that the leader just gives them the freedom for those employees to do their activities.

- **Transmission of informations**: as for information, the difference between boss and leader is in the way of dealing with the information given by his superiors. The boss takes the information and retains to himself. He does not pass it on, preventing the employees below himself in the company's hierarchical chain from having access to the information, which can be essential in the operational part of the company. In the concept of modern leadership, this information must be filtered, separating what is strategic, which should be with the leader, from what is operational, it means, the way of working.
- **The way they see their substitute**: for the boss, the replacement is seen as a threat to his position, someone who will take his place. For this reason, information and communication are no longer needed, so this potential "threat" will never become better than him. A leader acts in a completely different way, as he sees the substitute as an opportunity for himself to grow in his career. He will be concerned with forming a new leader, someone who will be able to be equal, or maybe, even become better than he was, as he will no longer have to worry about the obligations of that role when he's in the position above as he will know that he has trained someone competent enough to perform the role.

Thus, as we could see there are several differences among a boss and a leader. Honestly in nowadays in the 21th centuries' company, there are no space anymore for bosses, since they have already lost the "importance" once they had. Nowadays company needs leaders, people with new ideas and new mentality. Those employees, it means, the leaders are going to led the company to obtain better results they need. On the other hand, companies which insists on having bosses, they are taking a very huge risk, as they can bankrupt due to this indiscipline of those employees they considere "leaders". Usually companies which still have bosses are either familiar companies or small business. Multinational companies and intermediate to big corporations no longer have those kind of people in their team anymore.

It's more than obviously what kind of manager the companies need, isn't it? In underdeveloped and developing countries, which is the case of Brazil, country where

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I come from, unfortunately this is still a tendence on the companies. The reason is: as many of the companies are familiar or, at least, have few stakeholders, they are afraid to lose their influence and they are so conservative. However, this tendence is decreasing as a new generation are replacing the seniors (usually their parents or grandparents) and as they become from a new generation, and in most of the cases they have business backgroud, they want to do everything different in order to save their business and bring new ideas to the organizations. Doing this, usually families have conflicts, but we will discuss much more in the following chapter. Concluding this chapter, let's end up with some examples about some difference between them.

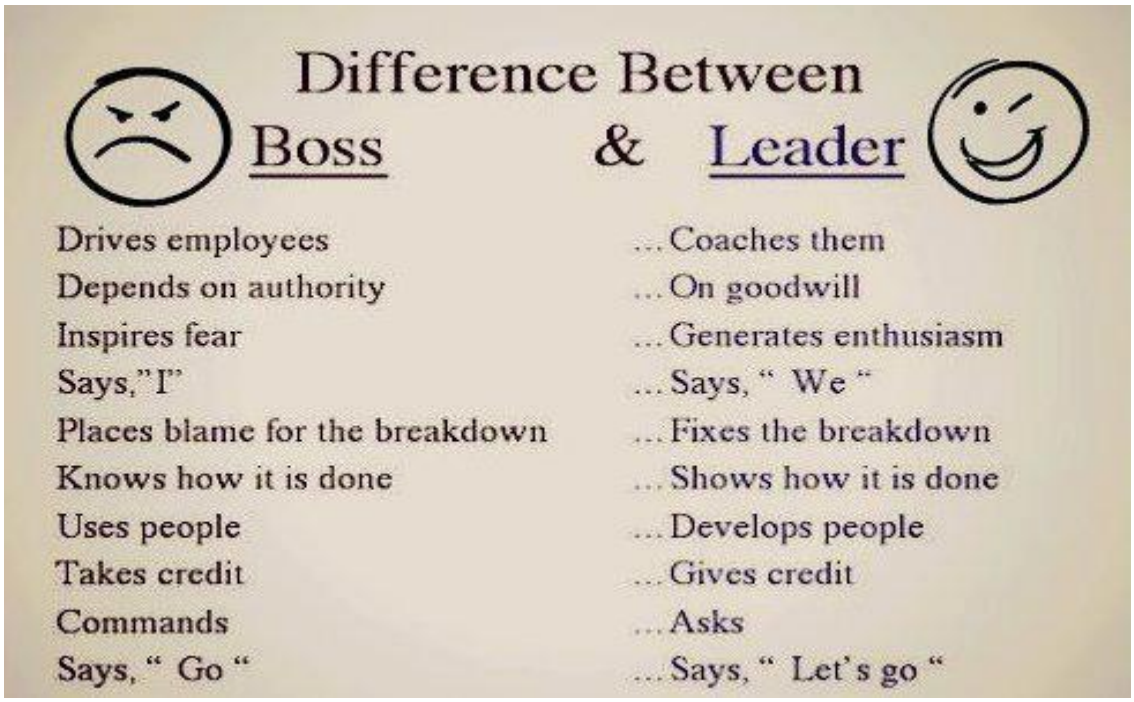

Figure 16: Differences between boss and leader.

Source: http://thinkapps.com/blog/post-launch/boss-vs-leader-startup-founders)

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2.2 Conflict of generations: Seniors x Youngs

"It's impossible to change humanity by the political mechanism" (Sri Aurobinda).

In the previous chapter we have discussed the diferences between boss and leaders, and we have found out that boss usually belongs to previous generations. Now, in this chapter, we are going to have an overview about generations conflict and how it can interfere in the performance of a company.

The companies are experiencing something that has never seen before in the history's labor market: several generations working together, sharing tasks, responsabilities, positions and also oppinions. Due to this reality, knowing how to deal up with and take advantage of what has been called generation conflict in the workplace, it is one of the tasks that a good leader will have to manage, since this new reality tends to remain going forward due to several factors, as we will see along this chapter.

In the scenario of such distinctive behaviours profiles, it's necessary having a lot of patience and empathy to lead, training and develop these people, so that, they can be part of the same team. And, thus, ensure the best deliveries for the organization they work for.

There are a group of 4 (four) generation that makes part of not only of labor market, but also from our society as we known. They are:

- Veterans: people who were born between 1925 until 1944;
- Baby Boomers: people who were born between 1945 until 1960;
- X Generation: people who were born between 1961 until 1980;
- Y Generation (also known Millennials): people who were born between 1981 until 2000;
- Z Generation: for those people who were born from 2001 until the presente days.

It's possible finding in a company all those generations which were mentioned working together, with the exception of the veterans, since great part of them have already retired and they are dedicating time for other purposes. Each generation has specifical needs, different mentalities and oppinions. Now that we know the different

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generations that exist in the society and also in a company, why not describe one-by-one for us to understand the reason of this difference between them?

1. **Veterans (1925 – 1944)**: this group is formed by those people who were born in the between of 1925 and 1944, those people lived the period of WWII and this period was marked by the economical global crisis of 1929 and military conflicts. Those people have more strong personality. This generation, tend to faithfully respect the rules which are imposed, being their main values: the moral, family and work. They lived in period where they should never contradict the family nor the religion. In terms of work they tend to work without any kind complain.
2. **Baby Boomers (1945 – 1960)**: due to the demographic explosion after WWII, this group received this name in a referance to the great population growth. These people underwent a cultural transformation in which the spread of mainstream media, through TV was an influencer who altered the behaviour of young people at that time. This generation was marked through the ideals of socialism, freedom, feminism, movements in favor of black people and civilian rights, homosexuals and many others. They are regular employee and appreciate stability, it means, they usually spend many years working for the same company, in some cases, in the same position until they retire. And as the previous generation, they have the tendance to wear so elegant to go working. Probably you have already seen seniors men with tie and suit going to work, probably those people belongs to this genetarion.
3. **X Generation (1961 – 1980)**: this group we can considere the first to be "rebel", because in their mind the company was not everything. For them, stability is important. Nevertheless, what differs this group to the others, it's the fact they expect more professional recognition. They are more pro active, dynamic and they think about entrepreneuship. This generation was marked by many events, such as: the hippies with the "peace and love", the Cold War and Space Race between USA and USSR, the reach of the first man in the moon (1969), etc., The main challange for this generation is to deal up with technological progress and keep following those changes which often happens.

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Because of that, they usually need extra time to be trained, which the following generations will be completely different.

4. **Y Generation (1981 – 2000):** this generation, also known as Millenials, is a group of people who were born in the time of technological revolution. If the Industrial Revolution was the replacement of work labor to manufacturing, this period of the Y Generation, it was the period of the replacement of writing machines into computers. While the previous generation had to pass through intensives training in order to know how to deal up with technological changes, this generation did not have much this problem, once since they were kids, they learnt how to deal up with computers at school or even at home. So, when it was time for working, they were "more prepared" if compared with the prévios generation: the X Generation. This generation is more informal than the others. Because of that, hierarchy and bureaucracy are not interested to them. They are more globalized, since they grew up in time where the internet was conquering space all over the world. And they think that the company needs to adapt to the employee and not the opposite. This is the first generation which challenge many Managers, once they want to work with what they want and they don't give much importance to social status. And money it's just a way to be independent. In terms of historical context, we can mention: the falling of Berlin Wall (1989), the colapse of the socialism and consequently the Cold War and the communication area mainly for the speed of the communication provided by the internet.
5. **Z Generation (2001 – nowadays time):** those people who were born after 2001 are known as Z Generation. This generation has spontaneous connectivity with the virtual world. They were born in a period where the technology domains everything and they are, in somehow, "slave" of it, because they don't know the world without it and if without the internet, most of them are not able to do much. They use the technology not only for working, but also for living, for example, upload several posts, photots and vídeos in the social media. And if the internet is for any reason not working, they get angry easily, because they have a kind of obligation to show the others what they are doing in order to collect "likes" and views. Most of those guys have just turned into their 18 years' old. And they are starting their professional career as internship. One of

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the main challanges to deal up with this generation in professional's term it will be how they receive orders and also socialize. As we have seen, most of them don't socialize at all, they have several friends in the social medias, they are popular, but only behind a screen. We know that for the best performance of any company, it's necessary having dialogues and how the companies are going to deal up with this problem from this generation it's a good question and we will have to wait a couple of years to realize those consequences.

Now that we have an over view about the different generations, the main question is: how to create a scenario where all those different generation work together in harmony? As we could see, there are people from those four generation working at the same workplace and they create a huge challenge for company's leaders and also HRs. The mission of those collaboratos will be mitigating this generation conflicts.

Every generation has different needs. The last two which were mentioned above, for example, they are motivated by challenges and they want to be promoted as soon as it's possible, otherwise they will not feel motivated if does not happen. Another aspect that make those generations different from the others are in the aspect that those finished their studies or are ust about to finish their studies. So, they believe they have a better understanding of techniques that they think it's too old fashion what the others generations are doing.

Perhaps you have already experienced a company where someone more senior says: "we have been doing this for several years and we will keep doing like this, because we know it brings results". However, the Juniors generation, let's say like this to refer to this group, as they have more information avaible in the internet and as they know how to look for faster if compared to those seniors, they don't accept those orders easily. They try to convince they have better sollutions. And, sometimes, they should be taken into consideration, but we know it's not so easy to convincing the seniors. On the other hand, when the seniors are contradicted, they inform that the juniors don't have enough experience as they have or that they have just started their career.

Because of this worldwide pandemy called covid 19 many companies had to adapt themselves and adopt the concept of working from home, which is called: home office or HO. Usually this is not a good practise adopted by many companies, once most of them still believe that the employees should stay in the office. Nevertheless,

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the Juniors think it's a waist of time going everyday to work and this work it could be done from anywhere, which is in part totally true, but of course it will depend on the kind of work. And, many companies, realized that from now on the home office will be a practise that will continue even after a vacine against covid being developed. On the other hand, it's hard to convince the seniors that they have to work from home. For them, it does not exist, since they come from another generations where it was necessary to be at the office for your boss sees what they were doing and to be promoted for your results.

The HR professionals and the leaders must look for fair ways that include everyone withing their needs. Older people feel rejected and prejudiced by the youngers, since in many cases they are unable to keep up with the same speed of changes imposed by the market, especially in terms of new technology. Nevertheless, younger people resent for not being met in many of their demands. The entry of new professional into the professional market is natural and expected, as well as in the normal cycle of our lives. The point is that it has been happening at a very fast pace and this has accentuated the differences between the generations when it comes to putting the work into practise. Not to mention that many leaders don't feel fully prepared to solve the problems that arise with differences in behavior and thinking. Some situations are new for everyone.

Thus, we know how hard is to creating a peace among those different generations. It's necessary having a harmony among the work team in order to creating a good harmony at the workplace. Obviously it's not so easy as we could see, however, through enough trainings, communication, dialogue and change of experiences, it's possible to achieve this goal, which's: the peace among the different generations.

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2.3 Tradditional companies x Startup

"We are going to change the fate of humanity, wether you like it or not" (Greta Thunberg).

The concept that is worldwide famous at the moment in the business world is the Startup. Although some specialists says that this concept began in the 1990's it was during the worldwide crisis of 2008 that it gained the importance we know nowadays. A Startup is a developed company which has an main objective of developing or improving a business model, preferably, scalable, disruptive and repeatable. The use of the term "company" has been questioned for startups. A startup is a newly created company still in the development phase which is normally technology based, but it can also appear in several other sectors. As this concept of organization has gained too much importance through the internet, many people associate them as being technological companies. However, any company which appears with a great potential of raise may be considered a startup. It's not really necessary to create something new from the zero point. For example, imagine you want to order a pizza. In the past, you should look for through the internet in order to verify if those places you found delivered where you live, or even ask a friend and even know the number of the place, because you got a propaganda letter in your letter box. Nevertheless, nowadays through those companies that develops Apps, almost all of the restaurants that delivery pizza (or any other kind of food) they will probably be in those platforms. And you can make a easily search of the tasty you want, price, delivery time, discount, etc. After some clicks you order what you want and you have several methods of payments, such as: card, money, paypal, bitcoins and many others.

Creating a Startup is obviously too risky, because as they have a new concept it's uncertain how the society will accept the concepts, once they have a innovation sollution in a scenario which was not enough explored. And working in a scenario like that where there are many changes happening all the time, it's just like a lottery, you invest money and you have to cross your fingers in order to win. Or also like the stock exchange market, where you invest the money and it's a kind of speculation, once who invests money is expecting that the valeu of the papers increase, however, there are no guarantee that this will occur and you must be ready to lose.

On the other hand for the tradditional companies the scenario is totally different. As they have a established market share, there are not much risk involved.

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Although, the success of them will depend on the strategies taken by the Top Leaders and also in some situation the economical situation may interfere on it. Thus, those organization they have a tradditional name in the market, people know their products / services and it's easier for them predict a demand.

The tradditional companies are usually so conservative in terms of strategies, because they are afraid to lose much or even lose everything. In some cases, they are satisfied with the results they got and they do not change, because in their mentality everybody knows the brand and people will keep on consuming from them. In this scenario, we can mention the Banks. For several years those institutions were extremely profitable and there was not huge competitors, because everytime there was a small company of investments, the tradditional Banks basically used the power, influence and their money to buy those small business. Consequently buy their know-how and get the clients to themselves. We know that the services provided by the tradditional banks were not good either, but as you had money saved and, for some people, money invested through this organization, you had no other opption: you should be patient and wait in the line or in the telefone to solve your problem. Nevertheless, probably you have seen the great quantity of digital banks which have been created in the last years. The tradditional banks now have competitors, because those people who have been creating those digital banks, they did that, since they realized people were unsatisfied with their financial institutions: it took too much time to be attenteded, they have to pay too much taxes for having a bank account, investiments great part of the profit they conquered was consumed by the bank through taxes of services, etc., so there was a problem and those people observed opportunities to create something new and provides to the clients what they really expect from a financial institution.

The structure is probably the most visable difference among tradditional companies and startups, because once the tradditional company has a office, where all the employees must be there on time, well dressed and have to follow so many protocols. In the startups usually they also have a office, but with the differece that they don't need to be there everyday. Most of the employees work remotely, it means, from home or anywhere else they feel comfortable, having much more flexibility and consequently quality of life to their employees, as they don't need to spend too much traffic to come and go. Having this flexibility the employees can use their time for:

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practising sports, read or any other hobbies they want and doing this, the employees will have more energy and motivation to work and consequently they will produce more and provide more results to the company they work for. Also in startups usually everyone has active voice, it means that everyone has the chance to give their oppinion and they are taken into consideration, forming a kind of democratic utopia. It happens in those organization, because most of the guys who works there, they had previous experience in the tradditional companies, where they were just one more employee and they were not listened.

The capacity of investiment is another difference among those companies. Usually in startups, those people who were the founders they have the idea, however they do not have the whole needed capital to make investments on it. So, they basically go to events and show their ideas in order to attract attention from investitors. There is a huge risk when you invest in the papers of a known company, so what to say about a company that has just been created? The difference is: investing in a consolidated company you are protecting your capital, from somehow, from the the colapse, because the prices can fall down, but also go up. And in a startup you can receive lots of money in a short period of time, since they are aggressive in their objectives. Nevertheless, the risk is too high, because it's unpredictable to know whether the customers will consume it or not. On the other hand, if a investitors decides to invest his capital in a franchasing of a known company like Mcdonald's, for example, he knows surely he will get his money back, which is known as ROI, in a determinated period and after that he will take only the profit. So it's very hard taking a decision of investiment, because all may happen in this capitalist business world.

Those are some differences among those tradditional companies and startups. There is no right or wrong. Both have advantages and disadvantages as we could see along this chapter. And they need improvements from time to time to keep on growing and conquer more and more clients. There are many startups that increased a lot, just like have some many that bankrupt. Even though they could get too much capital from investitors who believed in their idea. It does not matter whether your working for a known tradditional company or not, but if you don't have great leaders, with great strategies, who listen to their employees, who are updated about what's going on the worldwide business, then, you company is up to fail.

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2.4 Quality (wants to adjust) x Finance (wants to fire)

"Not everything that is faced can be changed, but nothing can be changed until it's faced". (James Baldwin)

If you have had the opportunity to work in any company especially in developed countries like Brazil, certainly you have ever heard that classical phrase from your leader (or owner of your company): "*we need to reduce the costs*". Obviously it's necessary doing some adjustments from time to time either on the process or in the finances. There is no doubt of it! The main problem is, in most of the cases, the adjusts proposed by the financial department is concerned exclusive on firing people.

Finance is a very important department for any organization, because it's their responsability control the cash flow, investiments to be made, aprove the salary to be paid for the employee, allow the payments to the suppliers and many other responsabilities. They understand a lot about numbers and how to make profit into a organization. But, in terms of adjusts in the process, most of them have no idea at all what it means. And, consequently, their focus are on the employees.

Firing people it's not a very easy task to be made. Why? Because it costs lots of money either to the company as to those employees who are being dismissed, because they have to receive money for being fired. And then people will say: "well, if the company is firing people it means they are saving money". Do you really think so? The answer is no. The reason is: it's very hard find ideal employees to work for any organization. Usually they pass through not only interviews, but also to practical experiences. Also the company needs to find out ideal candidates which have previous experiences and knowledges to develop the activities. It costs money, once the HR and the Manager of the department needs to find out time in their schedule in order to make those selective process. In some cases it's necessary to make investiments in the employees through: courses of specialization or courses to make them updated in a new technology (e.g: a new machine the company just bought). After investing a lot of time and money on those employees, is it simply to firing them? Well, the company can do it, however, they are losing a great opportunity to relocate them, because they can be easily hired by their main competitors and then the company will have another problem, once they are going to reveal the strategies used by the previous company

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they worked for. In other words, they are taking their knowledges with them and delivery to their new work place.

So, do you still think the company made a good business firing those people? If you had any doubts about it, surely after this explanation not anymore. Unfortunately companies in general still tend to think that they are doing a good business by firing employees, once many of them are just thinking about the reduction of costs. If the owners reflected for a while about what it was described below they would start looking for new strategies in order to keep on their employees.

Also the constant firing and hiring of people, which is called in the business word as Turn Over, it will make the KPI, which belongs to HR department increase. And different from several others kind of monitoring, this is one of the few indicators which is better to keep down and not up. Other examples of indicators that must be kept down are: reclamation of the customers, non conformits, number of accidents, etc. Back into the Turn Over, some companies in order to sign a contract with a supplier requires through this doccument that they want a Turn Over not more than 4%. Petrobras the main Brazilian company is one of the those, which requires this monitoring down to their suppliers. In case the supplier does not attend to it, they can cancel the contract without paying back anything to them, because it was written in the contract which were signed by both parties involved.

If by one side Finances want to fire people, on the other hand, as we will see along this master thesis, Quality wants to make adjusts. Sometimes the problem are not focused on the people (employees), but in the process. If the company is structured and have the principles of quality the whole organization, then, it will be easier to makes adjustments, on the contrary, it will be quite impossible. Unless the company really wants to change their philosophy.

Let's suppose in a organization after a meeting with the Top Leaders and Stakeholders the Financial Director showed the results and they were not what they were expecting. Surely this CFO would suggest adjusts in the organization, which means, cut off investiments, sell some proprieties (if the company has), reduce the team, a new IPO round to attract attention of investitors. After this meeting the organization will communicate the employees about the decision which was taken. Some people will start looking for a new job. Even those people who would not be fired, they will be afraid and they will try to find out something just to keep theirselves

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working, because nobody knows who is going to lose the job. Just like any crisis: this would be a chance for the company learn something new and improve theirself and not only providing cuts.

That's why in this aspect the quality management is very useful for any organization, because once they have the process of each department mapped, they can propose changes, they can correct mistakes, they can identify improvements in the process in order to gain efficiency. For example, let's imagine that the sales department does not have enough people to look for new customers. Would it be more efficient to relocate some employees, for example, from the production in order to work in this sector even momentaneously or hiring new employees which would cost more money? The first option it would be much better and smater than the second one, isn't that so?

Firing people should be the last stage for any organization, because as we could see along this chapter it's costs a lot money to realize it. So a good sollution for those companies which are in trouble is to require the support of Quality for them to identify the problems and transform the mistakes in opportunities of improvements. If you remember about the previous chapter where we discussed about the Six Sigma methodology it was made exactly this: the Motorola company was in financial troubles and they required the supportal of Quality department in order to provide a sollution to the non-conformits and the resut brought basically saved not only the company from the bankrupt, but also the world from a economical colapse.

Moreover, the organization needs to have Top Leaders who are updated into what's new in terms of administration and also having a critical mentality to solve problems. Maybe it will take some more generations for this idea becomes a reality among the companies. Nowadays we unfortunately have not got it yet. Mainly due to the conflicts among the generations, just like we have already seen in the previous chapter.

Thus, next time your company decides to reduce, if you work in Quality department take those concepts into consideration and be pro-active and smart enough to propose sollution just like it has been made along the year by the Quality consultancies, which are constantly saving companies from bankrupt and saving jobs from the employees. And if you have ever had the opportunity to watch the reality show The Profit, the presenter of this serial (Marcus Lemons) does exactly it on those companies he visits.

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3. Standardization

"Without a standard there is no logical basis for making a decision or taking action" (Juran).

There is no better sentence to start writing this chapter than this one above mentioned by Juran. Since the dawn of humanity, human beings have been looking for ways in order to make their life more effective. And along this History, many concepts, methods, tools and others have been developed in order to supply this world's necessity. The standard it's the process of developing and implementing technical standards. The Standardization aims to define technical specifications that help to maximize compatibility, reproducibility, safety or quality of a particular process, product or service.

If there was not standards in our society, maybe the humanity would have not been so developed as we are nowadays in the 21th century. Each nation along the centuries contributed somehow to the devolpment of science to the world. The Egyptians created their standards, just like the Greeks, the Roman, the Chineses, Mayas, Incas and other civilizations had their importance of the contribution in terms of science (chemistry, mathematics, physics, medice, etc), politics, etc. Because of that, even in the 21th century, at least, part of the culture is still presence in our daily routines.

Imagine how many years were necessary to create the Egyptian's pyramids, the Chinese Wall, the hidden city of Macchu Picchu in Peru, and many other wonderfuls from this world. Certainly it was not a very easy task doing that. Unfortunately there are not much informations and evidences about how those places were built and the nowadays scientists try to find out how those civilizations were able to create such increadible masterpieces. Probably those civilizations used some kind of technology which the knowledge was lost along the centuries, due to invasion and wars, which destroyed the written evidences. It does not matter how they were made, but what is importante to mention here is that for all those masterpieces standards were used. Certainly the civilizations failed a lot until the find out sollutions for their builds.

In TQM the standardization is seen as the "most fundamental of management tools and the basis for "routine management of daily work" (CAMPOS, 1992 a:1). And still mention this same author, he concludes: "the standardization only ends up when the work performing, as the standard is assured" (CAMPOS, 1992 a, p.3).

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Arantes (1998, page. 17), describes that the standardization consists in a cycle that contains:

- Plan the Standard: answering the following questions: who does what, how, when, where and why (method and goal);
- Perform in accordance to the standard: training on the job training or training in the work space. Working in accordance to what was learnt in the training;
- Verify (or Monitoring): check out the efficience of the binômio Standard and Training;
- Improve: improve the others points.

The first concepts of standard in the business world were developed and implemented during the first Industrial Revolution (or Industry 1.0), because at that time the machines were used instead of manual work, so that, the machines had the capacity to create products much more similars, which's totally different when it's produced by the hand of someone. Although the concepts on those times were not good if we compared to those we have nowadays, at least, the first step was given and along the centuries it was improved, mainly in the begining of the 20th century, through Ford and Fayol.

Nowadays the companies do not provide their products only to supply the local market, but also to foreigners countries. And, imagine if any country decides to have their local ways of standards? It will be impossible target any market. Of course, in somehow, each country has it owns independence to develop their own standards, however, those countries which decides doing it, they will have problems to make trades, once they have different rules for their products. For example: the cars in Great Britain have the steering wheel on the right side. On the other hand, in great part of the world the sterring wheel is located on the left side of the vehicle. So, in case, British companies want to sell their cars into other European countries, they have to produce those vehicles in accordance to the countries' regulation, or there will be no trade at all, because the regulation of the countries will not allow a vehicle with those standards.

Now imagine a company with 4 (four) different work shifts. How can the workers in this particular place perform their tasks so that the final product is the same, that standardization is maintained and, consequently, the final quality product is seen by the customers? It's really necessary creating internal requirements, standard

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operating processes, provide training to those employees and realize investiments in the R&D and also in the quality area, once the product must be delivered to the final client without defects, otherwise the company may have troubles. The standardization should not be the sole responsability of someone with technical knowledge, but it must be collective responsabilty action of each person in a different levels of performance (COELHO & XAVIER, 1993: 5)

It is not wrong having four different work shifts, the problem is having four different work shifts working independently without any kind of standards. To standard a company, for example, it's necessary to have meeting with the employees and discuss about ways and techniques, the problems that were identified, possible changes to improve the internal process, training the employees and last but not least guarantee that those employess understood those concepts. Following this direction, the four work shifts will certainly be standardized, or at least, the first step will be given. And then the continuous improvement must be done from time to time, in order to be obtain efficiency in the process.

There are some cases where the standardization can not be discussed among the whole employees, for example, the government has imposed that it can only be manufactured screw of a certain size, or cars, etc., in this case, the companies will have to adjust in order to meet those governamental requirements. We can also think about a customer who wants a determinated producted to be manufactured, so then, again the company will check it out the possibilities to delivery it or not.

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3.1 The benefits of a standardized company

"The great part of the managers' work is to solve problems". (MacGregor).

According to Falconi (1999), one of the greatest personality in terms of Quality Management in Brazil, standarding a process is very benefical to a company because:

- It brings better results;
- Standard is a way. The goal is to obtain better results;
- The standarded method is not fixed: it can be improved in order to obtain better results. If the results were better, many other people will adopt those concepts.

It's obviously that any company wants to fail, because the main idea behind each company is to be profitable and share the profit with the shareholders who invested time and money on this proposal. Neverthless, the companies needs often improvements in order to be competitive. Being like this they will be profitable and consequently the will maintain people working and help the society where they are located.

The standardization must be seen inside of a company as something that will bring quality improvement, cost, deadlines, security, etc (Falconi, 1999). It's very hard imagining nowadays' life without standards, for example, when we drive a car, if there were no international standards, driving would be hard specially if we were driving abroad. We can also mention the air traffic, it would have so many colisions. The words we use, the clothes we wear, devices, and many other examples we could mention. We are, in somehow, covered by standards around us. However, we do not pay much attention to such details.

The main idea behind creating standards is making something equal with less possible non confirmit to a product or service, because although non confirmit is not a waste, but a chance to improve something, it costs money and any company wants t ore-work in the process to correct a non conoformity, unless it's really necessary and worth doing it. The customers will never accept having something that does not meet their needs. So that, the companies needs to understand the customers' need and delivery what they are expecting to receive, or in some cases, provides to the customer something beyond to what the customers were expecting to receive.

When people think about standard a company, basically they think it's easy, just get the ISO 9001 certification and then the company has the needed requirements

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of standards and automatically the company has the quality implemented. We will come back to this topic a little bit later, when we will talk about this certifation and their benefits. However, from now I would like just to say it's simply not true. If it were so simply like this all the companies would be perfect and would have anything else to be improved. Below, let's describe how the standards are important to the society:

- Business: Standards are important to the bottom line of every organization. Successful companies recognize standards as business tools that should be managed alongside quality, safety, intellectual property, and environmental policies. Standardization leads to lower costs by reducing redundancy, minimizing errors or recalls, and reducing time to market;
- Global economy: Businesses and organizations complying to quality standards helps products, services, and personnel cross borders and also ensures that products manufactured in one country can be sold and used in another;
- Clients: Many quality management standards provide safeguards for users of products and services, but standardization can also make consumers' lives simpler. A product or service based on an international standard will be compatible with more products or services worldwide, which increases the number of choices available across the globe.

  (Source: https://www.guityinternational.com/quality-standard)

Fig 17: Principle of Quality Standards.

Source: https://asq.org/quality-resources/learn-about-standards

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From the above picture we can see that Quality Standards is in the middle. Maybe some people will ask: wouldn't it be right the customer to stay in the spotlight? Of course, however, in this particular picture, we are talking about the standards, remember? So, the guidelines of a company are generated by the Quality Management department and the idea is that the whole company is in the same wavelength.

Nowadays the companies standard their internal processes for many reasons. Below, let's see some examples and benefits of it:

- Avoiding variation in the process: on those companies which have no standard processes, each employee is independent to do their tasks in accordance to what he / she thinks it's correct. It's very dangerous, because it will interfere in the final product / service and consequently it will bring troubles to the company, due to the fails in this process, which does not exist;
- Meet the regulations: each country has their own regulations and the companies which are located in this country, they should meet the regulations, if not, they will have Legal Problems. From time to time, the companies pass through audits, inspections, etc., we can say that this is the reason why companies try to obtain certifications, because they want to show their customers (or even to target new customers / market) they are working in accordance to the Legal Requirements, Quality, etc.,
- Improve the results: companies that does not have a culture of consolidated processes culture are generally at a very low level of organizational maturity. But, what does it mean? We say that there is a culture of processes when the work done in the organization is based on clear and established procedures. In this direction, it becomes easier to promote the development of specialized roles with the knowledge and necessary skills to perform their tasks;
- Knowing the processes: this is one of the most common concerns of managers and directors. But when they are asked, these leaders often do not have na accurate sense of the processes that must account for the result. In addition, if the process is in the head of a single emplyee and he / she dismissed from the company, there will be a loss of very important information. This can impact on customer satisfaction and the result of the organization.

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If it's not so clear, let's try the explanation in another easiest way: think about a musical group. This group will be composed by some members, such as: a singer, someone playing drums, bass, guitar and piano. To be a sucessed band, all the members should be playing at the same time the same, playing the correct musical notes and rythm. If any musician decides to play what's more convinient to him or herself, the band will not be sucssed, because they will not be playing in the same wavelength. Or, if just a member decides not to play in the same wavelength, even though you are not professional musician, you will notice that the sound probably is not good.

It's a simple example, however, let's come back into the business world, the same situation happens within the companies, where there are several departments and each of othem is responsible to delivery something. The success of a company it will depend on the dialogue among the sectors, since every employee has a single final objective: delivery the final product or service. And, for the company, the goal is: meet the customers' needs. And, of course, conquer the profit.

Thus, those companies that have no good internal communication among the sectors, they tend to fail, because the succsses of the final product or service, it will depend on this interaction of them, which makes part of the organization. Let's remember the example which was provide above about the band, if any of the departments is not in the same wavelength, it's impossible that a company is going to have successes in their business. So, it's important that Sales understands the customers needs and forward the informations correctly to the Operational department, the inspection of Quality, the Logistics delivery the product on time and without mistakes to the final client, the HR to look for the correct candidates to work for them, etc., each department is important, there is no better department than the other one. All of them have their responsabilities and their importance to the company.

Last, but not least, below let's see some benefitis about standarzation for a company and comment one-by-one:

1. Correct use of the resourches: a company's resources need to be well managed to ensure business continuity. In this direction, the standardization of processes helps to make better decisions about investiments and expansions of teams, since it brings exactly the work that is done by the company. Doing this, it's easier to finding

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opportunities to improve the processes and optimize them, when it's necessary.

2. Avoid non conformits: when the process path is well defined, it's possible to reduce variations in activities. This applies both in the way of executing the process and in the variation of products. For example, if you go to a bakery, for sure, you know exactly what you are looking for and also what the establishment sells. So, if everytime you went to the bakery and everytime you realize the same bread you consume has a different taste, apperance and smell, perhaps you will never go there again and look for another place to buy what you need.
3. Avoid accidents: accidents will always happens and it doesn't matter the circumstances, however, when you have the standardization processes in a company, the chances of accidents decrease;
4. Increasing of productivity: as you may have already guessed, the standardization of processes provides the best way to perform a sequence of activities. Therefore, the best way is the one that brings speed, quality and fair price. In addition, it enables increased productivity for the employees and also to the organization.
5. Ease in training employees: process standardization offers a range of materials to document processes. These materials includes: procedures (online or physical), diagrams and instruction. This contributes a lot when it's time to training new employees, who will be able to consult reliable documents whenever it's necessary.
6. Improved customers experience: processes that deliver value to customers are those that most need standardization. This is because the impacts they generate are immediate. Therefore, companies that standardize primary processes usually experience an improvement in customers satisfaction and loyalty, which is very positive for everyone.
7. Transparency in processes: when you standardize processes you need to identify those responsible for carrying them out. Someone needs to be the "owner" of the process. It's worth highlighting the importance of the process owner, who is resposible for the results of the process. With standardization, there is more clarity about the boundaries of this

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responsability and who is involved on it. Often it will also be necessary to sensitize “participants”, who will help the owner to complete the process. This helps in motivating and retaining employees, who will be charged only for what they have committed to do.

8. Costs reduction: this benefit can be considered a consequence of other benefits previous mentioned above. Now, if the standardization of processes helps to increase productivity and make better use of the resources, this will culminate in cost reduction. So, with a larger budget and an understanding of the company’s needs, resources are now invested in the really priority areas.
9. Employee engagement: the employees also benefit from the standardization of processes. Likewise, they know exactly what should be done, how it should be done and why it should be done. In this sense, understanding the reason why a process exists is essential in motivating employees. So when people realize what they are doing they are more commited to the result.
10. Less processs redundancy: when the process isn’t neither well known nor understood to everyone, it’s common for redundant activities and duplicated effort to happen. This generates rework that could have been avoided if there were standardizing processes.

Obviously those examples above are just a general summary of the benefits that a company which is organized in terms of standardization may get it. There are several other examples which could be described, however, that’s not the idea to mention each of them.

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3.2 How to start doing the standardization and who should be responsible for it?

"There are three things that will never come back: the spoken word, the arrow launched and the missed opportunity" (Uknown author).

In this previous chapter we saw about the importance and the benefits generated to a company that has the standardization as part of their internal culture. So, it's more than clear to us that companies that have no standardizations in their processes are going to fail.

Creating the standardization for a whole company it's not na easy task, since it requires enough time and capacity from those employees who are in charge to make it comes true. And when the employees have not enough knowledge nor experience, the results will probably not happen in accordance to the company's expectation. However, who should be responsible for implementing the standardization in the company? How much time does it take? How much money must be invested in this project? And what are the benefits of implementing this techniques? Probably those are questions that the Director, President or even Shareholders are going to ask in case someone propose to do it in the company. Obviously, besides the last question that we have already seen the answer, for the others, there is no a precious answer, because it will depends on many variances.

The Manager is responsible for the technological domain in his/her area, therefore the person responsible for the standardization. Ultimately, the President is responsible for standardizng the company (Falconi, 1999). The Manger is the person, at least should be, responsible for managing a particular department of a company. Depending on the size of the company, this professional, in most of the cases, needs to be assisted by sub-leadership employees, such as: Coodinators and Supervisors, who will provide to the manager a general idea about how the service are being performed.

For many years in the humany history, the people depended on farms, trades and owners in order to get the products and the services to supply their needs. Nowadays, the people depends on mainly on managers (Kotter, 1982). The increasing in the importance of the organizations was accompanied by an increasing in the importance of the Managers, which is justified in that they are directly responsible for the strategy, setting, objectives and paths of the organizations. Drucker (1954, page

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341) records that “the manager’s work is similar to the music maestro and the Manager, in addition to conducting his orchestra, also plays the role of an interpreter”, it means that the Manager, through the decision-making process has the responsability to choose the paths of the organization and carry out the choice through himself / herself and mainly through his subordinates.

As we could see through the authors, basically all of them agree that the Manager is responsible for the best performance of a organization. Thus this professional is resposible to give the first step in order to standard, at least, his / her department. Of course, it should be more interessant to a company to begin the standardization in the whole company, it means, in all the departments at the same time. If not at the same time, at least, department after department. The great question is: who is going to do it? Honestly, it’s not so easy to respond, especially if there is no employee in the company who has never done it before or who has no experience on this direction. Anyway let’s see the both 2 (two) possibilities and let’s think about it.

Of course it would be easier to start the standardization in companies where there are employees with previous experiences on it. But previous experiences does not mean much, because the employees really need to know and understand how to do the steps of the Quality Management. That’s why normally in the companies there is a Quality department who’s in charge on provide it. In case the company does not have this department, it’s fine, because the company has some options. Below some of them:

A) Training collaborators: some employees will need to be trained by specialized company focus on quality;
B) Hire new employees: it would be also a possibility to a company, hire new employees who had previous experience with quality to develop this internal project in the organization;
C) Hire a consultancy: this is also a possibility, because those companies have the know-how about what to do.

It does not matter which option the company decides to take, because all of them have the same final proposal. However, in my oppinion, I would personally rather staying with letters A and B, because the last option, although it’d be an interesting option, it may costs lots of money, especially if the company has many things to be improved. So, only in extremely case, I would suggest take this option.

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There are several ways to start the standardization and it's up to the company or to the employee how to start doing it. Likewise, the best practise says that the first step is to create a structural organization chart. The reason of this creation is because through a Structural Chart, the whole company, or even a single department will have the chance to know who are the employees involved, the leadership, etc., nevertheless, some other may go directly to the Process Flow, SOPs or even KPIs. Honestly, I find more interesting to start from the Chart, because it's the begining of everything. Of course you can start from the others, but in some point, you will have to return to those stages. So, it'll be better go from 1 to 3 passing through 2 than jump directly to 3 and the return to 2, it makes no sense at all, right?!

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3.2.1 Chart

"I like the impossible, because there over there the competitor is inferior" (Walt Disney).

First recommendation is: create a Chart for each department, after that, create a Macro Chart, where all the company will be involved. Probably if you delegate this task to any employee, he / she will try to find out the name of all employees involved. It's not necessary! It's not relevant for a Chart to have the name of all employees involved. The HR department has it for their internal control, but it does not need to be described on this structure. What's really important in a Chart is to understand the positions and numerate. For example, in a company there will be only one CEO, however, there will be some Directors (e.g: Engineering, Sales, Marketing, HR, Finance, etc), the same will happen about Managers and other positions. Forget about the name of each employee, just focus in the position and how many of them are involved in the company. Because imagine if the company has 50 mechanics, 10 electricians, 10 drivers, etc., then probably you will never end the task of creating a Chart. Below in the Fig. 18 we will see an example of Chart in a organization.

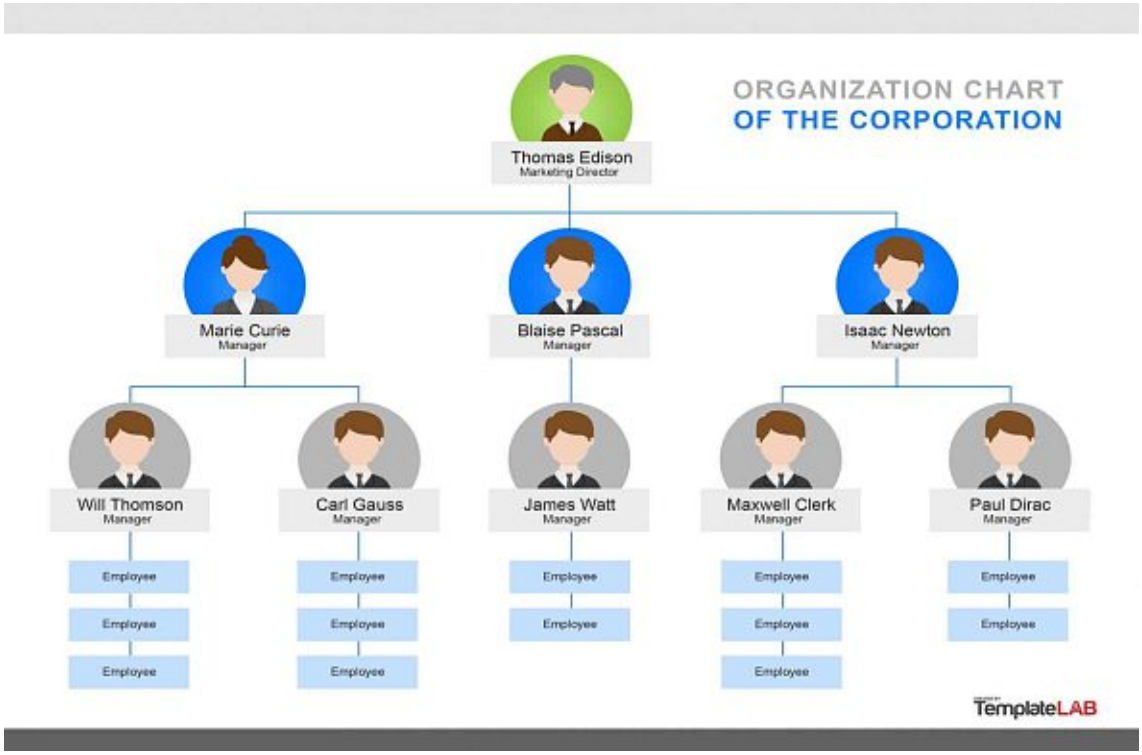

Fig 18: Organizational Chart.
Source:http://mgmtzone101.blogspot.com/2014/01/difference-between-organization.html

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From the chat demonstrated in the Fig. 18 we can check it out that Mr Thomas Edison is the Marketing Director, so he is the Top Leader of this deparment, which we can deduce is the Marketing department. It's also possible verifyng that below Mr Edison there are 3 (three) Manager, and below those Managers there are 5 (five) other sub-Managers. From this chart it's possible observing who are the leaderships. It means, in case a employee, who is located in the lowest level from this hierarchy he does not report directly to Mr Edison nor to the 3 (three) Managers who are below him in this structure. Of course if Mr Edison (or those other Managers) decides to have a meeting with the whole team, the employees can report to them, if they are asked.

A good example to understand the meaning of it, it's thinking about the hierarchy in the army forces. The Minister of the Defense responds to the President, Premier or King, it will depend on who's the leader of the nation in this country. On the other hand, the Generals receives orders from the Minister of the Defense and before put in practise, they usually discuss about it and the strategies, since the Minister of the Defense, normally is not a military, but only occupies a political position in the government and does not necessary understand anything about military strategies. When those part have a deal, then the General gives orders to their subordinates until the message reaches to the soldiers. The militarires will just go to a war, in case, the Top Leaders decide to declare a war to any nation. The militaries are not allowed to declare war to another nation without the command of the Top Leaders.

This kind of structure is called in the business word as: top-down or button-up. They are used to describe how decisions are made and how change is implemented. A "top-down" approach is where an executive decision maker or other top person makes the decisions of how something should be done. This approach is disseminated under their authority to lower levels in the hierarchy, who are, to a greater or lesser extent, bound by them. For example, when wanting to make an improvement in a hospital, a hospital administrator might decide that a major change (such as implementing a new program) is needed, and then the leader uses a planned approach to drive the changes down to the frontline staff (Stewart, Manges, Ward, 2015)

A "bottom-up" approach to changes is one that works from the grassroots—from a large number of people working together, causing a decision to arise from their joint involvement. A decision by a number of activists, students, or victims of some

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incident to take action is a "bottom-up" decision. A bottom-up approach can be thought of as "an incremental change approach that represents an emergent process cultivated and upheld primarily by frontline workers" (Stewart, Manges, Ward, 2015, p. 241).

So, it’s more than clear the importance of having a Structure Chart in the company, right? Remember: first create a Chart for each department and then when you are already used to this methodology then create a Chart for the whole company. Don’t worry about creating a perfect Chart, remember that in everything there will always contain the Continuous Improvement.

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3.2.2 Flowchart Process and SOPs

"A well-managed company needs to have the 3P well defined in its organizational structure. They are: people, process and product". (Marcus Lemonis).

After creating the Structured Chart and understand who are the leaderships and the collaborators involved in each department, it's time to understand how works each department. What does it mean? It means it's necessary to understand how department does their activities. Falconi (1999) calls this stage as "tidy up the house". This is, in my personal oppinion, one of the worst parts of this project. The reason is: on those companies who have no Flowchart or SOPs, if you ask each employee how they perform his / her activity you will get a different answer. And if you ask the Manager, in most of the cases, he / she doesn't know and will tell you to ask the oldest employee of the organization. I have personally experienced this several times and the main question is: how does this company can work if nobody knows exactly anything about their own department? It's simply to answer to this question: as nobody has never required anything like this before, the company was running through in accordance to what the leaderships' requirements.

Then, it's time to "tidy up the house", and differently from the previous stage, this one is the hardest and it will require from the person (or people) involved to do it. However, one more time it's important to mention: do not worry about delivering a perfect Flowchart or SOP, the simply pro activity of trying to do, it's enough to make you aware that your work is paying off. And, consequently, over time through the applying of the continuous improvement the process will be improved everytime you think it's necessary.

Even before diving on how to create a flowchart, let's see some definitions of this technique. Flowchart is a type of diagram, and it can be understood as schematic representation of a process or algorithm, often done through graphics that illustrate in an uncomplicated way the transittion of information between the elements that composse it, that is, it's the sequence operational of the development of a process, which caracterizes: the work that is beging carried out, the necessary time for its accomplishment, the distance covered by the documents, who is carrying out the work and how it flows among the participants and departments of this process.

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Definitions about processes are founded in several branches of Science and always with similar mearnings. Below is the definition of process in accordance to some authors.

Flowcharts are widely used in software projects to represent the internal programs' logic, but they also can be used to design business processes and the workflow that involves several corporates actors in the exercises of their duties. (Carlos, 2015).

For Harrington (1997), the process is defined as any activity that receives a input, adds value and generates an output for an internal or external customer, making use of the organization's resources to generate concrete results. For Soliman (1999), a process integrates people, tools and methods to execute a sequence of steps with the definite objective of transforming certain inputs into certain outputs.

Andersen (1999) understands process as logical series of transactions that converts input for results or outputs. On the other hand, Golçalves (2000a) consideres the process more than the transformation of inputs into outputs, but also the involvement of endpoints, feedback and repeatability. For Davenport (1994), the process is a specific ordering of activities in time and space, with a beginning and an identified end.

Likewise, a process is composed of: inputs, outputs, time, space, ordering, objectives and values that result in a structure to provide services and products to customers. Its importance in companies is confirmed through the observation that through the Japanese companies industrialists invest 70% of their research and development funds in process inovation and have far superior results than American companies that they invest the same proportion in product development (GONÇALVES, 2000b).

Through the analysis of the process, it's possible to propose a management, in the sense of offering improvements, through prior mapping. There are four approaches that should be considered in the development of possible process improvement sollutions, accroding to Barnes (1982). They are: to eliminate all unnecessary work, combine operations or elevements; modify the sequence of operations, simplify the essential operations.

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Thus, mapping helps to identify the resources of waste, providing a language to handle manufacturing and service processes, making decisionss more visible, so that you can discuss them.

Now that we have already seen some definitions, let's get back into the practise. Assuming your task is to map the process of Sales from the company, the best practise says that it's important you combine a meeting with the leaderships from this department: Sales Manager, Sales Coordinator, Sales Supervisor, etc., only the Sales Director would be irrelevant to this meeting, because for sure he / she will always be busy and will have no time at all to contribute to your work. Once having all of those leaderships, it's necessary to focus on this activity. Explain them the reason you are there and how you want to help them to improve their department. Remember, if you are new in the company, normally those people who are already there, they will not want to contribute to you, so be kind and gentle. And ask questions that can help you to understand how that sector works. For example:

A) Could you explain how start the sales process?
B) How often does this sector make purchase?
C) Who are the suppliers?
D) Why those companies are the suppliers?
E) Were there any criteria for choosing these companies as suppliers?
F) What are the documentation involved in this process?
G) What is done when the purchase is wrong?
H) Is there any kind of penalty for the supplier who delivered the wrong product? How does it work?
I) Is there any kind of monitoring used by the department?
J) Is there a purchase acceptance limit? If there is a minimum amount that an Analyst is authorized to purchase and how much does the Analyst need to ask for authorization?

Those questions above are just examples of question you may use in order to map the process, obviously you may ask others which can guide yourself in order to get the informations you need. It's very important that the person who is in charge of mapping this process make all the possibles notes, because those answers are going to provide the necessary inputs this employees needs to supply the flowchart.

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After having this meeting with the leaderships of the sectors, perhaps you will have a puzzle to complete, since there will be so many informations and it's necessary to put them in the correct order. The best way to do it is drawing a flowchart, because through this tool, it's possible understanding how the work starts and ends. Another good way that helps into this task is talking to the employees involved in the process. As they are there daily working on it, sometimes they have a much better understanding of the process than the leaderships. And also, those employees know where the mistakes are, so it's very important to talk to them as well and not only be focused on the leaderships. Everyone in the company may contribute somehow for the development of your tasks.

Probably this person in charge of mapping the process have no idea about with technic should he / she uses for doing it. There are several avaibles tools in the internet which you can use to map the process, however, I would recommend using Excel. The reason is: it's possible to opening this file in any computer, since all of them have it. If you decided mapping a process through other tools, just like Visio, for example, your work will be limited only to those machines which contains this programm. And imagine your boss needs to make a presentation to the customer and can't open this file?

Let's remember the company has never done something like this before, so anything you realize, it will be treated like a discovery, when in reality, we have already seen that those concepts exists more than a century, at least. So, be focus and get the informations to assembly the "puzzle" you have to. Remember that the flowchat is obligatory divded in 3 (three) parts. They are:

A) Inputs;

B) Processes;

C) Outputs.

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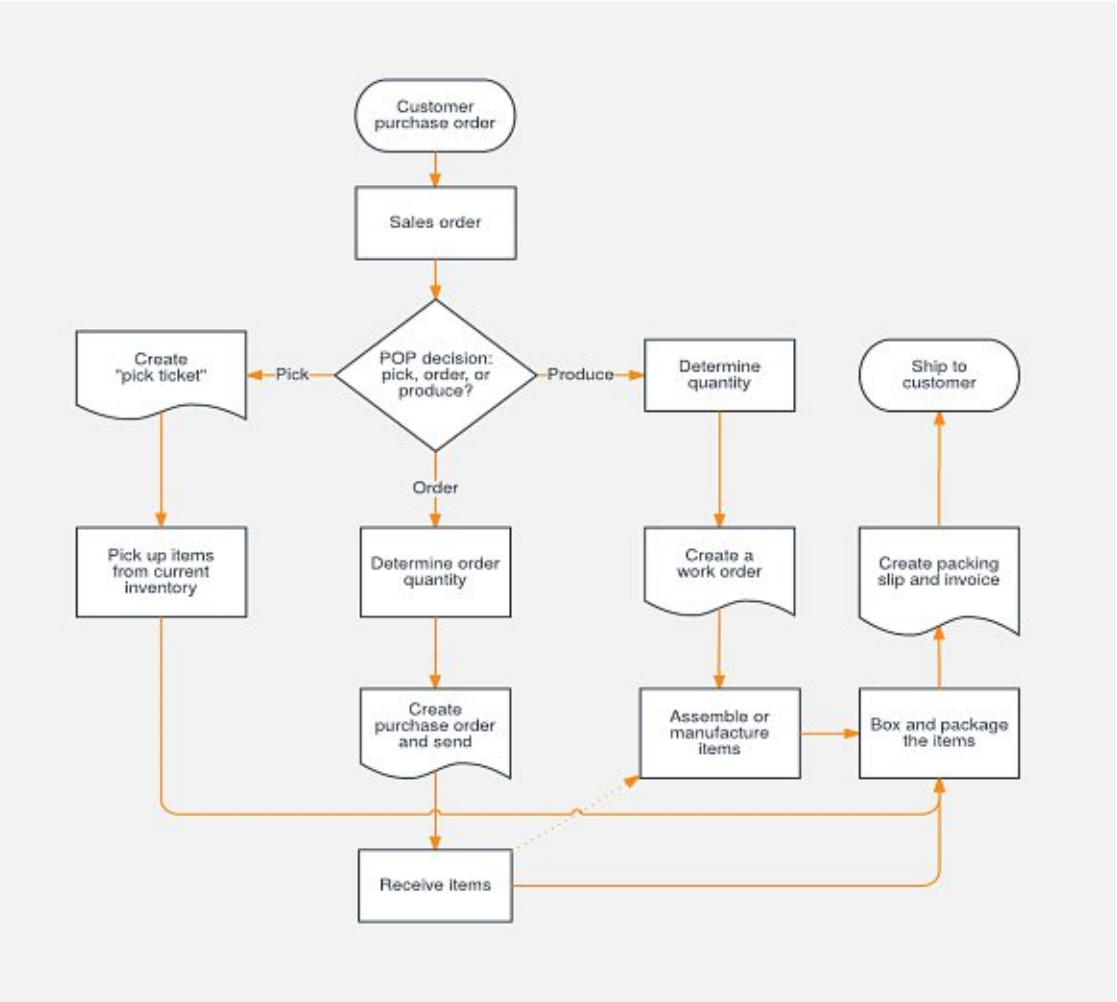

Figure 19: Flowchart

Source: https://www.pinterest.com/pin/805370345848186499/

The Fig.19 is about a simply way to mapping a process. Where the input is: "The customer purchase order", we have the processed involved in those boxes and the ouputs is the "ship customer".

When someone map the process for the first time, it's better to map something simple like this, because the information can be easily understood by everyone. And again, along the years, or everytime you think it's necessary, just make adjustsment put in practise the Continuous Improvement.

Now let's see another example of mapping process, however, this time in a advanced level. The diferences among them are more than obviously, because meanwhile the first one is so simple the following one will be more complex. Nevertheless, the main idea among them is the same, which means, identify how starts,

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develops and ends the process in the department. Below in the **Fig. 20** we can see the diferences among those two charts.

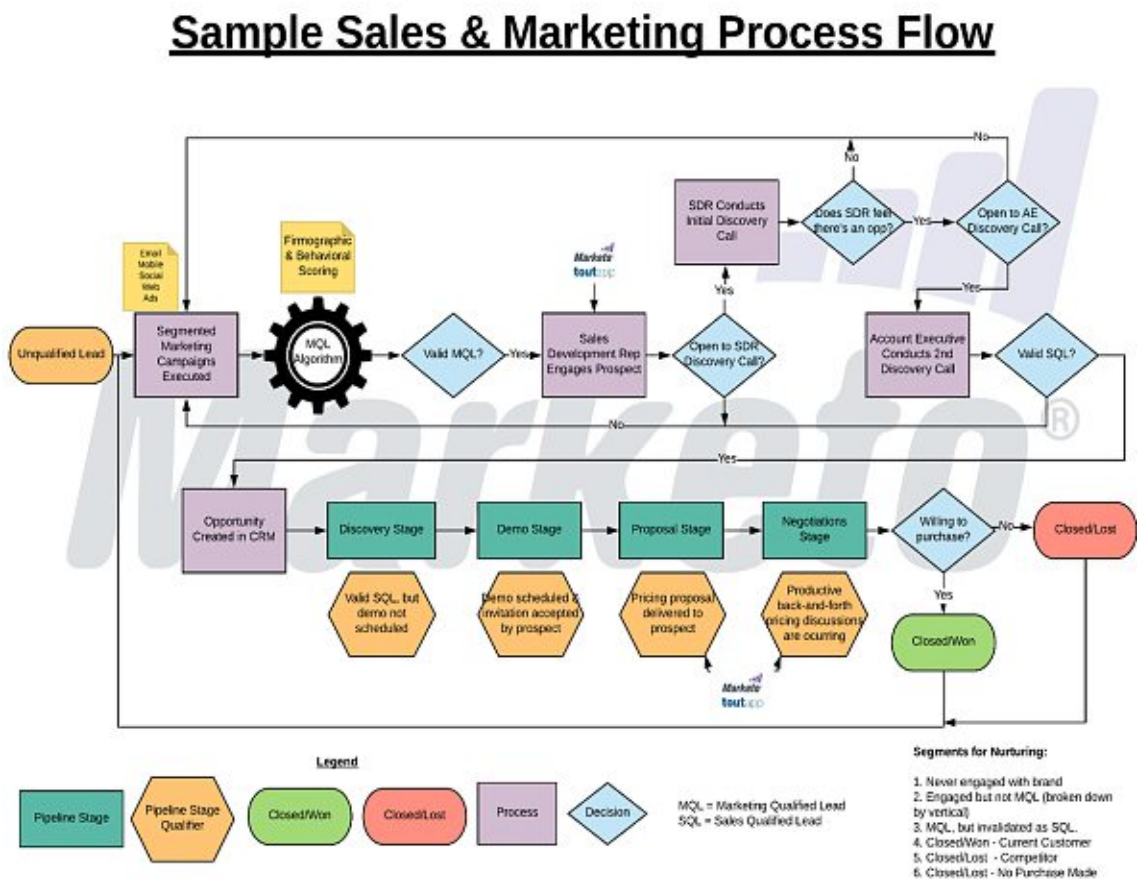

Figure 20: Flowchart Process Sales.

Source: https://blog.marketo.com/2018/03/need-sales-marketing-process-flow-achieve-alignment.html

The difference among those flowcharts are obviously, isn't it? The first one is simple, on the ther hand, this one is much more complex. But they have the same proposal, which is identify the how happens the routine in a determinated department. And also we could say that probably this flowchart was improved along the years.

When the company has the flowcharts of each department, it's easier to training each new employee that they hire, because during the training period, the instructor may provide this document to those new people who will make part of the company and informing them that's how this department works.

It's also very important to have the flowchart, because through this technique, it's possible to identify in which stage the problems happens and them it's easier to

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make adjustments. Much better than stop the whole department (or production) and trying to identify where the problem comes from. Remember: time is money! And stop the deparment is synonim of lose and waiste time and money. Not only identify the problem, but also it's easier to make some improvements in each stage through goals. We will come back into this topic a little bit later when we talk about KPIs.

Thus, I guess it's clear about the importance of the flowchart for a company, isn't that so? Again, first try to be focus on each department and then map the all processes which are involved in a company, it's much easier doing it. If you decide to map all the process at the same time, maybe you will have more troubles than sollutions.

Basically the flowchart process is used only for the leaderships of each department or even by the Quality in order to find out sollutions to make the work more efficient. On the other hand, also SOP (Standards Operating Procedure) can be used. A SOP is a set of step-by-step instructions compiled by an organization to help works carry out complex routine operations. It's the written form of the flowchart and it's easier to everyone to understand how works the internal works at a company department or even in the whole company itself. It means: everytime the flowchart passes through an improvement, the same must be done with the SOP and vice-versa, since they are the same document, however, in different formats.

The SOP must be written in a detailed way to obtain uniformity, either in the production or in the provision of a service. Each document must be part of a standard relation. Some items must be included in its format, such as: header containing the type of document, title, code, company or instituition logo, responsible area, responsible person, dates of preparation, approval and authorization, objectives, field of application, scope or applicability, responsabilities, abbreviations, definitions, descriptions of the procedures, references and attenchments. Pagination, version and last revision number may be in the footer. Access to SOPs, whether on a pape ror in electronic format, must be controlled and limited users, and any revision and updates should be properly approved before the implementation.

When the improvements happens, the employees must be informed about the changes, through training or presentation. It will depend on the complexity of the changing. And, it's very important that after informing the employees about the changing, a training list is passed where employees will put their names and their

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respectives signatures, stating that they are aware about the changes and that they received the training.

Last but not the least, if the person who is charge to mapping the processes has no previous experience on it, it's better to skip for the next stage which will be the monitoring the process through KPI. However, if this person has previous experience on mapping the processes, for sure, this professional will try to identify immediately the failures in the process, in accordance, to what people are going to reveal. Again, it's necessary to have a meeting, but this time, it's not necessary to have a formal meeting with all the leaderships once. For this stage, it's considerable this professional stay for a couple of days in the department and make some interview among the employees.

Normally the employees have the answers you need to develop your task, because they work daily on it, so they know exactly in which stage of the process contains failures, however, even though they have already tried to explain several times to the leaderships, those leaderships did not take them seriously. So, probably, they want to say something, but as they are, in most of the time, afraid on being fired, they keep the informations for themselves and do not share it.

Thus, the informations should be collected within those employees and, that's why one more time I mention in this thesis, it's important that this person has previous experience on mapping the processes, on the contrary, this collaborator may be problem to develop him / herself. If this person has not experience, at least, he / she should be assisted by someone who has to support the activities. Many tools can be used in order to collect those informations. The most popular may it is the 5W2H, which is a tool the cointain questions, like:

- Why?
- When?
- Where?
- Who?
- What?
- How?
- How much?

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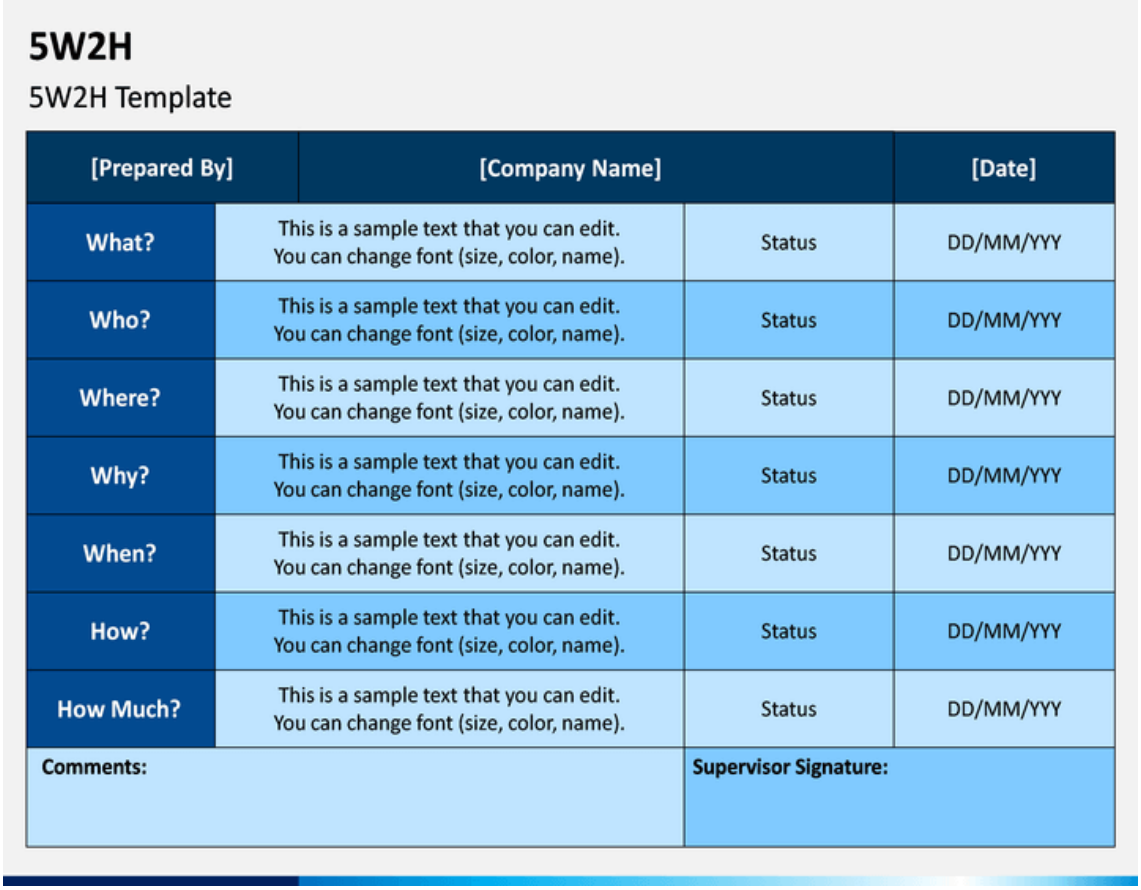
Those are question used by the specialist, manager, etc., who is charge to identify problems, variations in the process or even opportunities of improvement in the department or in the whole company itself. Those question guides the professional in his target into achieve the goals. Again the successed of this identification it will depend on the experience of this professional of findings mistakes and know how to suggest sollutions.

Everytime someone uses this tools in order to help in their tasks, it's important mentioning the observation and consequently think about a sollution to this problem. Just like any other quality tool, the tool does not do anything by itself. For each mistaken it's necessary to ask if not all those question, great part of them, just like in the process flow, there will always be a start and end, or in the business language, there will always be inputs, process and outputs. Below, let's see an example of template of 5W2H.



5W2H

5W2H Template

[Prepared By]	[Company Name]		[Date]
What?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
Who?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
Where?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
Why?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
When?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
How?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
How Much?	This is a sample text that you can edit. You can change font (size, color, name).	Status	DD/MM/YYY
Comments:		**Supervisor Signature:**	

Figure 21**:** 5W2H template.

Source: https://www.sketchbubble.com/en/presentation-5w2h.html

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It's just a way in order to help in the guidance of re-mapping the process, then you will start your interviews to the employees like this:

A) What is the stage, in your oppinion, that contains failures? Writing the answers in accordance to what the employees responded;
B) Why do you think it contains the failure? Answer from the collaborator;
C) Who is responsible for doing this activity?
D) Where does this activity happens?
E) When does it happen?
F) How could it be improved in your oppinion?

Only the last "H", it means, the How Much, that depending on what's being mapped it does not make too much sense asking, because not everyone has understanding of how much it would cost to implement the improvement.

After verifying with the employees of the department the failures or non confirmits in the process, it's time again to demonstrate those mistakes to the leaderships. However, don't forget they are probably very busy. So, in order not to occupy their time only showing their mistakes, it's necessary to propose some improvements to make the process efficient. In this case, the Continuos Improvement. Otherwise, if you go to a meeting just to demonstrate the failures, maybe it was cause an insatisfaction with your work and the leaderships will no longer contribute to your work anymore. Most of the leaders they know how to perform their work and develop the motivational of their time. Nevertheless, most of them are not ready to solve problems. They know they exist, however, they don't know how to give a solution to it.

On this direction, the employee in charge of mapping the process could use a Report of Process Analysis, just like in the Fig. 22:

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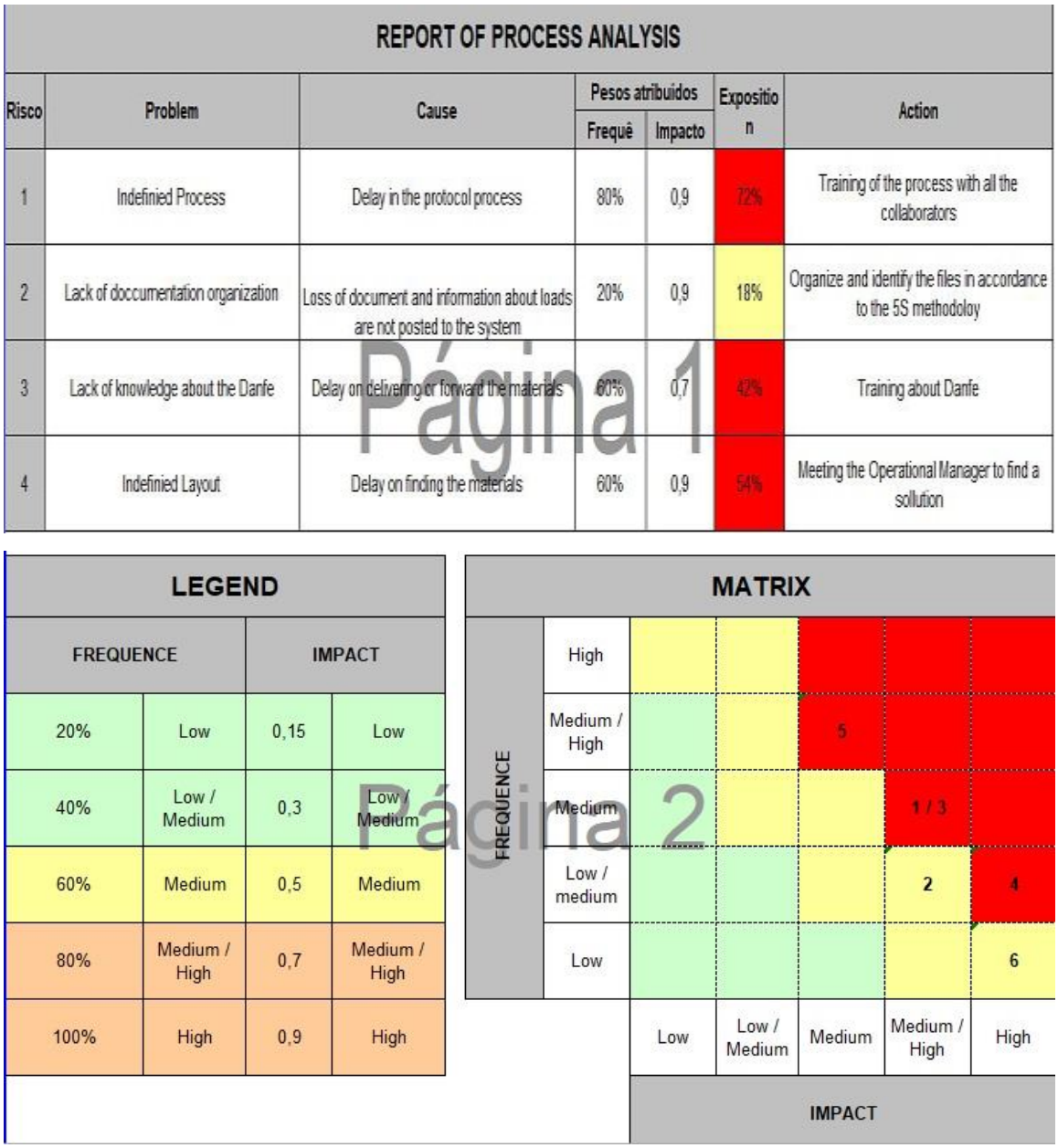

REPORT OF PROCESS ANALYSIS

Risco	Problem	Cause	Pesos atribuídos		Exposition	Action
			Frequê	Impacto		
1	Indefinied Process	Delay in the protocol process	80%	0,9	72%	Training of the process with all the collaborators
2	Lack of doccumentation organization	Loss of document and information about loads are not posted to the system	20%	0,9	18%	Organize and identify the files in accordance to the 5S methodoloy
3	Lack of knowledge about the Danfe	Delay on delivering or forward the materials	60%	0,7	42%	Training about Danfe
4	Indefinied Layout	Delay on finding the materials	60%	0,9	54%	Meeting the Operational Manager to find a sollution

Página 1

LEGEND

FREQUENCE		IMPACT	
20%	Low	0,15	Low
40%	Low / Medium	0,3	Low / Medium
60%	Medium	0,5	Medium
80%	Medium / High	0,7	Medium / High
100%	High	0,9	High

Página 2

MATRIX

FREQUENCE						
	High					
	Medium / High			5		
	Medium				1 / 3	
	Low / medium				2	4
	Low					6
		Low	Low / Medium	Medium	Medium / High	High
		IMPACT				

Figure 22: Report of Process Analysis.

Source: own personal material

Although this template contains the legend, it is necessary describing how it works. First, the person has to describe the problems and what is causes. For example, still talking about the Sales department, let's imagine that one of the problems on this process is to get the authorization of the Sales Manager, because he is always busy, he is always in conferences, he is always visiting a customer, etc., and he is the only person who is allowed to authorize the purchase for the sector and anybody else is. So in this case we will have:

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A) Problem: authorization of the Sales Manager;
B) Cause: delay in the purchase process. Consequently all the departments which depends on this purchase can not work, due to this failure;
C) Frequency: 80% (medium / hard);
D) Impact: 0,7 (medium / high)
E) Risk exposure: 56% (too high, red light)
F) Action: propose a minimum quantity that the Purchase Analyst is authorized to purchase.
G) Action II: propose that the other leaderships just like Sales Coordinator and the Sales Supervisor can authorize the purchase.

For each “red” impact it’s essential to act quickly through an Action Plan. For “yellow” impacts, they need to be treated, however, without must haste when comparared to the red. And when the impact is “green”, it can be momentarily ignored, however, never forgotten.

Having proposed those improvements to the leaderships and they have approved it. Always remember to collect any kind of evidence in order to protect yourself and also to prove you did something and the other part agreed. So create a form or even check if there are some form used by the company to collect evidences or training, changes and etc., and again, never forget to collect the: name, position, signature, date and what was the proposal of the meeting. With those evidences you are protected in case someone complains about the change. It’s a very important tip!

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3.2.3 Training the collaborators

"The greatest benefit of training does not come from learning something new, but from doing better what we already do well" (Peter Drucker).

Training refers to the process of acquiring knowledge, skills and competences as as result of professional training or teaching practical skills related to specific useful skills. This forms the core of learning and provides the contente needed to develop some specific activity. In addition to the basic training required by a trade, occupation or profession, technological advances and the competitiveness of the mordern world require workers to constantly update their skills, throughout their professional lives (Aline, 2006).

Business training is a type of preparation that takes place within organizations, which enables employees to improve their qualities and skills, with the aim of increasing their personal motivation. Training provides an improvement in the production of daily tasks, and consequently contributes to the company's results by increasing its responsibilities. There is greater competition in organizations that are aligned with technological advances, there is a search for increasing productivity that intensifies the demand for adequate training (Robbins, 2002).

It is understood that the execution of the training is the realization of the training, after all the process of survey and planning. For the execution of the training, all the previous aspects have already been analyzed and evaluated by the company's strategic and tactical sector. The important thing in the execution of the training is the work of uniting the trainer and the trainees in a specific line of the company, which is the learning of its employee and the subsequent growth of its knowledge, which will be of great importance for the organization (Chiavenato, 1994).

In the training evaluation stage, the entire process is investigated to see if there were any training failures. It will be verified from the strategy and the structure applied to the result achieved by the trained. The most important thing for the company is the type of feedback that the training will generate for future business intentions, so the evaluation at the end of the training is essential to know if this objective has been achieved. If the objectives set at the beginning of the training process are not achieved, the process must undergo a review with corrections to achieve all goals. It is noticed, then, that the evaluation of the results is the comparison of the activities carried out

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before the training and after its accomplishment. In order to finish with positive results, all training processes must be worked through in a complete way (Marras, 2001).

Many companies provide training for their employees, whether in the workplace (internal) or outside (external):

- Internal training: it takes place in the company's own facilities, in normal work situations, with tools, machines, documents and other materials that the trainee will use in his daily work activities. Internal training is often used in training.
- External training: it takes place off-site and in normal work situations, which means that the trainee does not count as a directly productive worker during the training period. This, plus the fact that many entrepreneurs see training as an expense, not an investment (Marcos, 2007) makes this modality less attractive for small and medium-sized companies.

Now that we know a little bit more about the concept of training through some authors, let's return into our business world, where it's time to training the employees. In this stage of the project, this training must be conducted by someone with experience on it. The suggestion is to delegate this task to one of the leaderships, but in case the employee who is mapping his this capacity, he / she can do it, but the leaderships should be presente, because this employee does not make part of the sector. So, the good practise says it's better to have, at least, one of the leaderships of the department, in order to know that changes are coming and this idea that is going to be implemented was previously authorized by the Manager.

The training must be made among the collaborators, informing how it was and what was improved. The benefits must be shown and explained, etc., it's essential to mention during this training about a deadline about when the change is going to be implemented. This stage must be agreed with the leaderships, because all the employees must be trained and the company itself needs a time to absorve the changes. Likewise, at the end of the training, it's essential to open a space for questions and finish, of course, with an evidence about the training. Never forget it: evidence.

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3.2.4 KPI

"If you can't measure, you can't manage it". (Deming).

The above sentence from Deming defines everything what we are going to see in this chapter. The KPI (Key Performance Indicators) refer to a set of quantifiable measurements used to gauge a company's overall long-term performance. KPIs specifically help determine a company's strategic, financial, and operational achievements, especially compared to those of other businesses within the same sector. (Source: investopedia)

According to Chiavenato (1999) the indicators are performance indicators are assessments of activities performed by employees, the goals and results to be achieved and development potential.

The performance indicators represent the quantification of processes and can be defined as numbers that describe the reality of an organization (FERNANDES, 2004). All productive operations need some form performance measurement so that it is possible to identify the priorities for improvement within organizations. After measuring performance, managers question whether the result points to a good, bad or indifferent scenario (SLACK et al., 2006). According to Fischmann and Zilber (1999) the indicators help the managers to identify the performance of their business, and thus provide support for making decision-making and restructuring of investments to achieve the objectives.

According to Slack et al. (2006) there are five general performance objectives: quality; velocity; flexibility; reliability and cost. Table 1 shows typical metrics to achieve each of the aforementioned objectives.

Table 1 – Metrics to measure the performance objective.

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Purpose of performance	Possible metrics
Quality	Consumer complaint level; average time between failures; number defects per unit.
Velocity	Response time to the consumer; cycle time; frequency of deliveries.
Reability	Percentage of orders delivered late; adherence to programming.
Flexibility	Time to change schedules; machine change time
Cost	Cost per hour of operation; labor productivity; variation against the budget.

Table 1: Purpose of Performance / Possible metrics.
Source: adapted from SLACK *et al.* (2006).

Now that we have a general idea about what KPIs are, let's return into our example about the employee who is charge of develop the standardization in the Sales department. Obviously that the first question that should be made is: "how do you control your activities?". Belive, but great part of the worldwide companies do not have any kind of monitoring. On those companies which have any kind of monitoration, the focus are on the Sales. The reason is: more the sales, more the revenue. That's the logical! It's correct, however, it could be much more improved, right?!

In case of companies which do not have KPIs or any kind of monitoring in their process, then it's necessary to creating them. However, on those which have, then, at least, it's possible to have an overall idea about how's the process going on. Let's see those 2 (two) possibilities.

A) Company without KPIs (or any monitoring): for those companies which does not have any kind of controlling, have no idea of KPI, etc., it's recommended to creating KPIs in order to have an idea of how are the numbers are and in paralel work in the standardization of it;

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B) Companies with KPIs: at least, some results the companies have. So, it's possible to take some conclusions and define goals and even verifying possible improvements.

Again thinking about companies which have any kind of monitoring. There is no clear rule for monitoring time. However, some statisticians say that a reasonable monitoring period is at least 6 (six) months, so that you have a general idea of how the operation is going. The most advisable would be to wait 1 (one) year, because after this period, it is possible to have a more comprehensive idea of the results. But, it's up to each company, since each of them have different mentality, and, consequently, their own strategies. After this period mentioned, it's possible to start to create goals and define strategies in order to achieve it.

All departments must have KPIs, because without this monitoring, it's impossible to know wether this department is being efficient or not. For decision making by the leaders of a company, it is important to have this monitoring. Otherwise, how will they, for example, propose a target for the next month of 10% on the sales when compared to the previous month, if there is no monitoring? Difficult to answer, right?

Another important thing to be mentioned is the quantity of KPIs. Any author will never recommend how many indicators must contain in a company. They will just mention that the company needs and that all. So, each company is free to decide what indicators are important to themselves. Nevertheless, they can be created, in case, the company realizes it's essential to monitoring something else and the same to exclude a indicator, in case the company realizes it's not essential monitoring it for some reason.

Once more let's mention those companies who have no KPI: those organizations, at least, have any kind of financial monitoring, because owners they want to check it out, wether they are getting or losing money. At least, this indicator all the companies obligatory have it. Unfortunately, it's not possible to conclude anything having only one unique indicator, because it does not mean anything at all to the whole process. Some people will say it's possible, because you can plan more or less, how much money the company is going to make the next month. Wrong answer! Without indicators in the Commercial, Operational, Sales, etc., it's unpredictable to plan anything.

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About the goals, remember they are defined by the leaderships of each department. It can be either the Manager or the Director, but it will never be the Assistant or Analyst, for example. And of course the leaderships have to create possible goals for their team. And the goals may be adjusted depending on the performance of the team. For example: let's supose the Sales Manager of a company after a meeting informed that the monthly goal for the department is selling 100 products. We may have 3 (three) different results:

A) The department achieved the goal: in this case the leadership should keep on with the goal and check out the performance in the next months. In case the department is achieving or even overtaking the goal. The leaderships should give other goals, just like: "let's increasing the goal in 5%".
B) The department almost achieved the goal: the leaderships will have to understand what went wrong, maybe the goal they implemented was too aggresive, maybe the economy isn't well, etc.,
C) The department was so far away to achieve the goal: this is the worst scenario, it means the "P" from the PDCA was totally not well planned. And a Action Plan must be made in order to correct this mistaken.

Also there are some cases of companies which implemente very aggressive strategies. For example, in Brazil, there is a famous company of drinks, which is known for implementing too aggressive goals to their employees. Impossible goals, I would say. Because of those goals, the workers need to work far beyond their normal working hours. And, consequently, many end up not enduring so much pressure and asking to leave. Those workers who remain in the company are physically very worn out, because, they are very focused on reaching the impossible goals that this company implements.

Neverthless, the creation and monitoring of the process is the last stage of this project of the implementation of the standardization. Of course it does not ends up on it. The following part it will be the Continuous Improvement, however, we are going to dive on it on the chapter 5. As we could see until now, it's not a very easy task to make the standardization, isn't it? Obviously the work is going to be well performed in case the employee responsible to do it have previous experience. For those who don't have at all, the standardization may cause nightmares.

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3.3 The challenges of standardization for small business

"Be not afraid of growing slowly, be afraid only of stading still". (Chinese Proverb).

Now that we know a little bit more about the benefits and how to put in practise some methods of standardization, probably you have noticed all the time I was mentioning structured company, it means, those companies which have, at least, a little bit of the mentality that something needs to be done in order to conquer new customers and become more efficient.

On the other hand, normally small business have serious problems to implement changes, since the owners think it is a waist of time, training is not necessary and stop the production is synonym of: "I'm losing money". Due to this closed mentality of some small owner business it's harder to convince them about the importance of the standardization and continuous improvement. If the company has more 20 years of existance, for example, the owners will pronunce sentences just like: *"This company exists for 20 years and I've been doing since I was 15 now I'm 60 and everybody knows our company and the customers are completely satisfied".* Companies with this mentality may have the experience and the knowledge how to produce their products or services, however, if we dive on it, we will realize the company has a lot to be improved and, for sure, the financial situation isn't good at all. Why do I say this? It's simply, if a company is not opened for new ideas, consequently it's not performing well.

Just to give an example of my theory, if you have ever watched the TV programm "The Profit" starring by Marcus Lemonis, you will know what I mean. It works like this: a company writes an e-mail to this programm require the help of Marcus Lemonin, who is a billionaire businessman from the USA, to be partner on their business and help them to improve or, in most of the case, to save the from the bankrupt. Those companies who are chosen by the programm he visits, but of course, he reads about the business in advance before going there. And he makes a visiting to the company, he talks to the owners and also to the employees, because he wants to understand what do they produce, who are the competitors, how long of existance they company has, etc., in the end he wants to see the finances. After checking out the

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finance he always requires a time to think. After review the finances he makes an offer to buy a percetage of the company and to become a partner of this business. Normally at that point the owners are affraid, because in his offer he says the following sentences:

- I'm going to invest "X" thousand dollars for "Y" % of the company;
- I want to be 100% in the management control of the company to do the changes.

At this point the conflicts start, because the owners normally think the price is too low for the percentage required and also they are afraid of giving up of their "power", even if it's momentaneously, to someone strange. However, Mr Lemonis is a businessman and has several years of experience to make business, has several contacts along the country and the world. So, having a partner as him, it's a great chance and maybe an unique opporunity of learning and develop their business. That's why many owners accept the deal. The focus of Mr Lemonis is what he says, the theory of 3P or the supporting pillars of a company. They are: People, Process and Product. Below, let's describe one-by-one:

A) People: they are essential to all organizations, because they have the experience and the knowledge of how to make something. However, the correct people should be in right position. For example, it makes no sense hire some on who has previous experience in HR to work in the production.
B) Process: we have already mentioned before in this thesis about the importance of the processes. However, in most of the companies which requires the help from Marcus Lemonis, they do not have it. Basically people know what to do. The problem is when people decide to quit their job or when they are fired, since they took away the knowledge with them;
C) Product: the best performance of A and B will be demonstrated in the C, it means, the final product, which will be delivered to the customer.

Although it looks like a very simply theory, it's really works out. We have to remember that each observation and each simply theory for more simply that it is, it's important to mention, because it may be a kind of guidance for developing your tasks and consequently to the best performance of activities. So, never think something is not relevent, since most of the time the key for sucess is there.

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Figure 23: The 3P theory.

Source: https://laconteconsulting.com/2018/12/20/6-versions-of-the-3-ps

Although appearently it's a TV programm it's really taken seriously. And the TV host has already mentioned it many times through his social media and at the end of each season a general resummary of each company he visited. Some companies decides to keep on following his steps. Nevertheless, there are some companies for any variety of reasons, which do not want or even get his money for the own benefits of the owners.

This is just brief of how hard it is in practise making business with small organizations, especially in terms of changes. On the other hand, when the results appears, especially when the profit comes, the owners are completely satisfied, since who does not appreciate profit? I think everybody does, am I right?

As we have already seen until here, it's not so easy task to convince the owners of a small business of implement changes, because many of owners of those businesses are seniors and it's hard to convince them that their kind of manage a company is old-fashioned. Normally the small organizations wants to implement new ideas, because of the following reasons:

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A) They are almost bankrupt: they need urgency on implement something new in order to save the business;

B) I heard of it: some owners decide to implement new ideas, because they heard through a customer or from another company some ideas that increased the profit, so they want to do the same in their business;

C) Pressure of customers: it oftens happens, a customers requires, for example, a certification ISO 9001, in order to sign a contract. So, the owners do not think twice and they want to have it, even though they have no idea about this certification and when changes needs to be done, they are a little bit aware and don't want it. However, it's easier to convince the owners in this case, just inform them if they don't want to implement those ideas, the consequency of it, it will be: no contract, consequently no increasing of revenue nor profit.

D) New partners: the children of the owners assumed the control of the company, so they have another mentality, more opened mind to new ideas and basically they were influenced by the new ideas of the university.

Those are the most classical cases for a small business implement changes. For example, I personal experienced once a small business which wanted to implement the 6 Sigma methodology, because the owner heard about it through a conference of a customer. Probably this owner heard about how benefical this method is, because when you hear that basically through the implemention of this method you will have 3,4 failures for every 1 million opportunities, that's what a owner of a company has. However, it's not so easy to implement it in a small business, 6 Sigma costs lots of money and it's more useful to medium and large business, not to a small one.

The best way to make improvements in a small company is starting with the standardization, because depending on the complexity of the business, it's not necessary to spend much money in order to implement the ideas which had already been shown in this work. In case you are hired by a company to implement new ideas, this would be the best strategy to start, since let's remember you are probably new in the company, so it means, nobody knows you and after you implement the ideas and the results appears, you will be recognized and certainly you will be promoted faster than some other employees who are there for years.

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Remember that in small organizations there will be much more challenges than in well-structured one. Neverthess, small business is a great opportunity of learning, because you will probably see the whole process. In medium or large organizations normally there are some process you may have no acess, because of the policy of the company. And again about well-structured companies, it's hard to learning something new, basically you will just work on the continuous improvement, but you will no longer see how everything began.

Thus, small business are a great school for learning. It's harder to implement the ideas? Yes, it's. However, the experience you will get there, it's something priceless and it's something that you will certainly learn throughout your professional life.

Everytime you are hired by a company and if you realize it doesn't have any kind of standardization, have proactivity to call the responsability for yourself. In the beggining you will create so many enemies, because nobody likes change, but along the process they will realize you completely changed their life for better and they are not so stressful compared to how they used to be. The human beings don't like changes, although they are needed from time to time. And in the business world it's not different. When you make part of a small business, remember you have a lot to do. Anyway, never give up, keep on going in this direction, and sooner or later the company will realize you did a great job and the idea you were the it was useful and now the business is improving more and more daily. When the results come and you are recognized for that, you can decide wether you stay or look for new challenges, however your legacy will never be forgotten.

Below let's list some examples of troubles you may have when you decide to implement those new concepts in the small business when you think comment to them about the standardization:

1) Informations: some people will refuse to contribute to the development of your work, because they may think: "if I provide the informations, maybe I'll be fired". So, many employees will not contribute to your work and you have to convince them that you are there in order to help and not fire them;
2) Managers: in many small business the Manager is friend or have any kind of familiar relations with the owners, it means, they will never be fired. The

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point is: you need to convince the Managers about the needs of the changes and you need his / her supportal.

3) Change: you will have to convince the people through showing presentations, for example, in the Power Point, showing the graphics, providing previous experience where you worked before, etc., about the importance of the changes;
4) Managers: in many small business the Manager is friend or have any kind of familiar relations with the owners, it means, they will never be fired. The point is: you need to convince the Managers about the necessity of the changes and you need his / her supportal.

Always have in mind it's not so easy task realize the standardization in small business. Even though you may know what to do there will be some obstacles as we have already seen, but never be down, because if you have the capacity of doing the changes, convince. If you realize you are just waist your time, kick out and look for new challenges, since surely there will be other companies where your tallent can be more useful.

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3.3.1 Why is it important the direction's participation?

"The Top Management's task is not management, but leadership". (Deming)

The term diretor refers to a person who has the fuction of directing a determinated institution, such as: a company, a business, a theater, an educational establishment, etc., The main task of this professional is to direct, direct individuals that belongs to his / her team and get the best from those people in order to achieve the goals. It's the diretor who bears all the responsability for a directed activity, that if things go well, this professional will be responsible and also them same situation if the things do not go well, its this professional responsability.

This diretor will guide his / her subordinaters to get the best of each one, and thereby contribute to the proposed objective. In companies, the diretor is divided by departments, for example, Sales Director, Operational Director, HSEQ Director, etc., however, all of them have the General Director above them in the hierarchy or the CEO, it will depend on the configuration of the company. This employee is the one who has maximum authority in the management and administrative direction of a company.

Company directors need to demonstrante clearly characteristic, actively and continuously. In this case, communication is a determining fator for living with customers and other interested parties.

According to Fayol, the director's job consists of making decisions, seeting goals, defining guidelines and assigning responsabilities to the members of the organization, so that, the activities of planning, organizing, commanding, coordinating and controling are in a logical sequence.

The Directors are the top leaders of a organization, so that, they delegate orders to the Managers about what they expect about each single department. On the other hand, the function of a Director it does not only consists on delegating order, but also represent the company they work for in conferences, meetings and workshops.

We can say that a company does not have a good performance in case it does not contain a efficience direction, the institution is a cycle where there are several departments or sectors at each level, as in the previous scenario, one sector depends on the other in order to obtain organizational sucess, remembering that for better success in the management of a company, the administrator first needs to establish

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objectives, plan in a way that the whole process is executed, be a good leader, pass confidence to the employess and very importante to be a good listener and always be open to changes.

Thus, a strong point that we cannot fail to mention, the management of a company must be democratic and be exercised through communication, leadership and motivation of the institution's members. The management of the company acting in this way, reviewing these points mentioned above, will be moving towards success, reaching its goals and objectives, having the satisfaction of all participaints in the organization.

Nevertheless, we have seen a little bit about the importance of the direction to a company. Now, let's imagine you have some tasks to be done in the company. For a good performance of your work, in case of something new like make the standardization or any other delicated project you take part of, it's very important that the direction's participation, because when the direction agrees and starts this project together with you, everyone in the company will respect your "new proposals" of changing to each department. Of course when I mean that the direction should participate with you, it does not mean that the directors should be all the time with you analysing what are you doing, however, before starts the project of standardization, for example, the director should make a speech to the collaborators informing about the changes that are going to be implemented, etc., on those companies where the direction do not do it, normally the departments do not contribute anyhow, because each employee is affraid of what is going on.

The directors are important to a company, however, the main problem with most of them is only one: the lack of updating in their career. That's a trouble which the companies usually have, since great part of the directors as they are seniors and almost getting retired, they think they know about everything, once nobody reaches at this position without years of experience and knowledges, which is totally truth. But, on the other hand, many of them as they don't upgrate theirselves about what is new in the business world, they have old-fashioned mentality. This same topic we have already seen when we talked about Seniors x Youngs.

For those companies which the direction does not participate they have great chance of fail, since they are the top leaders and if they do not participate why do other people should take it seriously? It's a very hard question to answer! The leaders should

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be the first people to arrive at a company and the last to leave. Unfortunately it is not what usually happens, because the Directors are somewhere, maybe visiting a customer or trying to arrange a new contract for the company, and they just appear when something either bad or not happens.

Thefore, you may be asking yourself how to deal up within those companies where the Directors or even the Top Leaders don't participate at all? For an obviously reason you must not force them to participate, otherwise you will be fired. Everything in this world you have to convince. So, this is the right key for the success, it means, the convincing. And how do you have to do it? Simply you should propose a meeting with great part of them and once they are there, you as a Top Leader or even a Quality Manager, should inform them about their need in the daily routine. If not possible daily routine, no problem! However, they have, they must participate more, because once the leaders participate the employees are motivated to perform their tasks.

It's not so easy to do it, I know! Thus, you must try and again try to bring some examples from the companies you worked before as benchmark, or even, try to look for some examples in the social medias like Linkedin or searches on Google or any other seek platforms. The importante in this activity is that everyone, in this case, the directors understand that without their participation, without their support, the company will have a great tendance of fail. To be successed usually it takes lots of time to make it comes true, on the other hand, to fail it does not really need much time. Once they understand that, surely they will participate much more on the activities.

This tendance it has been changed in the last years, in part, due to the change of generations in the top management's company, since those people have in mind that they should do things differently from the other generations. Maybe it's one of the reasons why the startup concepts are gain more and more market when compared to the tradditional companies.

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3.3.2 Is ISO 9001 enough to solve all the internal problems?

"Who sleeps, dreams. Who works, conquers". (Brazilian proverb).

On the last decade, the ISO certifications became so popular among the companies. Most of them target on it, just because they heard from a competitor which conquered better results due to this certification and the benefits that was brought to them. And many of the companies associated those better results to this certification. That's why it became more and more popular in the business world. It's good that many companies decided, at least, in somehow to obtain this certification, because it shows to the society that they are working in accordance to quality standards. On the other hand, having a certification is not garantee of success and prosperity as many companies may think.

The abreviation ISO refers to name *International Organization for Standardization.* It causes a little bit confusing on people, because the abreviation should be IOS instead of ISO, however, it's a word that comes from Greek language, which means "equal" or "equality", once the main purpose of this system is to make equal the whole productive process of a organization.

The most known certification is for sure the ISO 9001, which is the certification which refers to Quality Management standards. However, there are several other groups, for example, the ISO 14001, which provide guidelines to Enviroment Management System. ISO 17025, which delas with the certification of calibration and testing laboratories, etc.

Probably you have already seen companies that have the IMS *(Integrated Management System)*, it means, they have the 3 (three) most commons certifications, which are:

- ISO 9001: Quality Management System;
- ISO 14001: Enviroment Management System;
- OHSAS 18001 (being substituted into ISO 14001): Occupational Health and Safety Management.

As we could see that last certification does not make part of ISO family, because OHSAS it is a British standard which provides guidance for an organization

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to be able to implement and evaluate itself in relation to its occupational, health and safety procedures. Nevertheless, after many years of negotiations, OHSAS was finally incorporated into ISO families. And it was chosen the number 45001 for it. Right now the companies which have the OHSAS 18001 certification will have a deadline until March of 2021 to substitute it for this now on, as the OHSAS will no longer exist.

The purpose of this work is not dive into those certifications, but only demonstrate that they exist. Back into the certification which is more popular among us and the companies, which is the 9001, many companies along the years looked for obtain this certification, since they wanted to updated. But, what does ISO do? What is ISO for? What are the objectives of this certification? Those are probably questions that companies ask themselves before thinking about having this documment.

The ISO 9001 certification can be used either for qualify the service provision or qualify the manufactured product. And in case of a company have both categories, they can certify both. It will depend on the strategy target by the direction. For Meegan and Taylor (1997), an organization may obtain a ISO certification simply because its products or services to be performed according to some procedures. Motwani *et al.* (1996) affirms that there is a widespread false conception that ISO would imply higher levels of product quality. This certification does not guarantee that the quality of an organization's products or services is better than the quality of other organizations. Following the same direction,

Tsiotras and Gotzamani, (1996), emphasize that it's better to say that the ISO is intended to guarantee the consistency of quality rather than a highest quality of an organization's product or services. On the other hand from these authors, for Brown and Van der Wiele (1996), the implementation of ISO 9000 improves the quality product.

Now that we know a little bit more about the author's oppinion, let's suppose a company decided to certify the product that they manufacture in accordance to the ISO 9001 requirement's. Even though there is no menu to inform what's the first step to be given, it's important to verify if the Quality Department is able to do the necessary changes into the company. In case they can, great! In case they can't, then it would be better to hire a Consultant Company focus on this certification in order to prepare the company with the changes which are obligatory.

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Once ready and have done the internal audits, the company will have to look for a certified body company accredited to the IAF (International Accreditation Forum), to make the auditing. Examples of those worldwide companies are: Bureau Veritas, DNV, Rina, TUV, etc., however, as those companies are worldwide known the services provided by such companies tend to be expensive. In some countries, it's possible finding smaller companies which are allowed to do the same services for a lower investiment. The auditor will make interviews among the departments and will take the notes. And after have seen the whole process of manufacturing he / she will provide the report from what was observed and will recommend or not this company to the body certification.

The companies which decide to obtain this certification have, in general, several reasons for that, because the ISO has objectives and it's not only a piece of paper to put in the wall. Below, let's check it out some of those objectives that makes part of this certification:

1. Obtain an overview of the organization;
2. Standardization of all key organization processes, processes that affect the product / service and consequently the output to the customer;
3. Monitoring and measurement of manufacturing processes to ensure product / serive quality, through performance indicators and deviations;
4. Implement and maintain adequate and necessary records to guarantee the traceability of the process;
5. Quality inspection and appropriate means of corrective actions whenever necessary;
6. Systematic review of quality processes and system to ensure their effectiveness;
7. Reduce costs with higher productivity;
8. Increase market opportunities, since many large companies only buy from supplier which are certified by ISO 9001;
9. Improve the company's image;
10. Impement the culture of the continuous improvement;

Surely just like any other topic, there are much more examples involved, however, let's be concentrated only on those examples which were described. If you

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remember about the PDCA cycle, perhaps you have already realized that all those informations described are totally linked to it, isn't it?

When we talk about ISO certainly comes into our mind the Mission, Vision and Values and also Quality Policy. What are they for? It's through those words that are on those doccuments that the Direction of the organization communicates what they except from their employees in order to provide customer satisfaction and achieve the goals. The Fig. 24 we have an example.

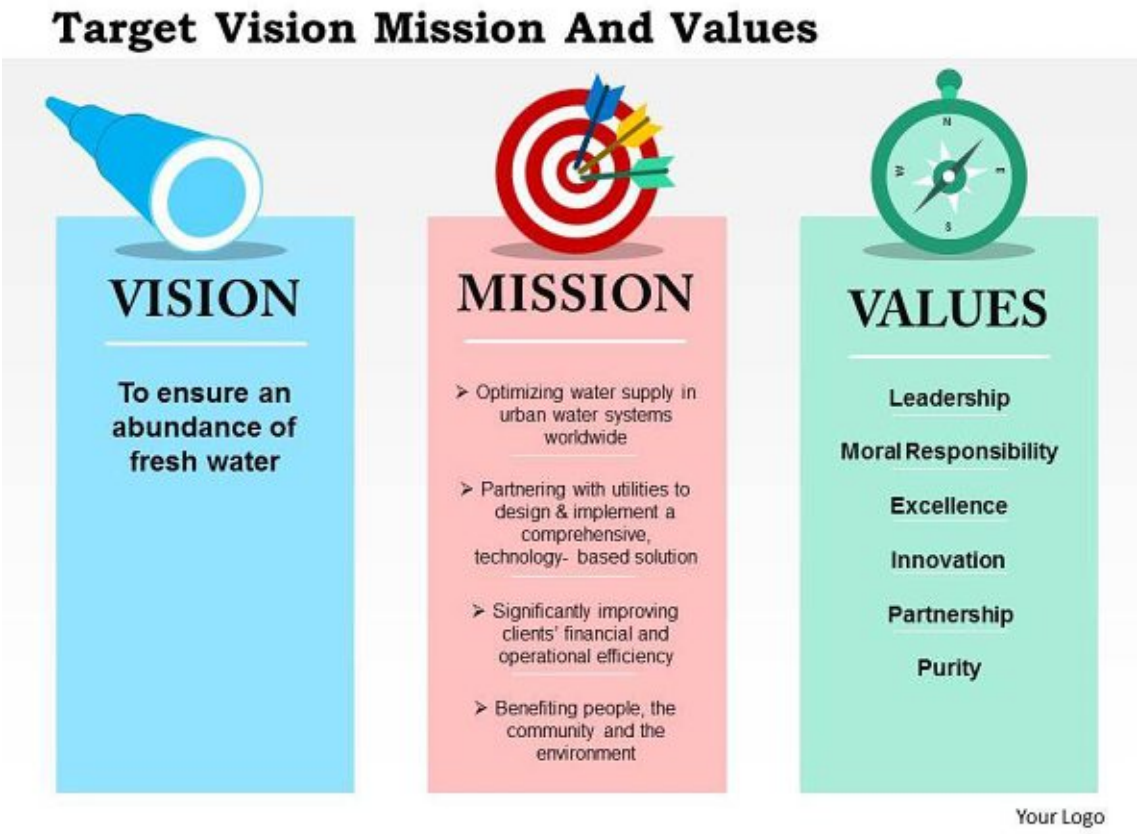

Figure 24: Vision, Misson and Values.

Source: https://www.slideteam.net/target-vision-mission-and-values-flat-powerpoint-design.html

In this template, even though there is no logo of the company, we can deduce it belongs to a company which provides water, since in their Mission it's written: "to ensure an abundance of fresh water". And we can simplifying those words just like this:

- Vision: it's the situation where the organization expects to reach;
- Mission: it's the purpose of the organization existance;

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- Values: they are the ideals attitudes that the organization, compromising and results that must be presented in the whole working team and in the relationship with the customers, suppliers and other parties involved (like stakeholders).

The Quality Policy has an overview about the goals of the company including the Mission, Vision and Values. It's usually informed all channel of communication of the company, for example, in the website, in the intranet, rooms and etc. Normally in organization which have the HSEQ (or just QM) department they inform when new employees were hired or from a determinated period of time they explain the importance of this policy. The usual mistake which the organizations do is: writing too much unnecessary informations in this policy. Why? Because the company should never do it, otherwise, they can get a non-conformity. For example, let's imagine a company decides to add in their Policy Quality the following words: *"the company expects to increase their revenue in 10% in comparision to the last year"* or *"the company expects to meet in 100% the customer's satisfaction"*. In theory it's very nice, but in case the company does not meet this requirement, they will have to open a non-conformity and they will have to treat it. We will come back to this topic of non-conformity a little bit later.

Another question that goes through many people's mind is about the size of a company which can be certified by ISO. Certainly many people think only medium and large companies can get it, however that's not true. ISO was created to serve all types of organizations. Nevertheless, in the initial versions of it, only large companies were certified, especially large industries. Due to the costs of training the team and the long projects, the consultancy cost much more than small and medium-sized companies could afford. Along the years, several specialized consultancies started to emerge and the costs of certification began to go down, and so the prices of the implementation projects gradually decreased.

As it was already mentioned in the beginning of this chapter, in the last years, this certification became worldwide popular among the orgazations, especially because giant organization have in their internal policy the practise of only make trades with those suppliers which have the seal of ISO. For this strategical reasons, many companies decided to obtain this certification, and unfortunately, many of them do not really put in practise those ISO's concepts along the whole year. Usually the

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companies just decide to start working on it around 3 (three) or 4 (four) months before the visiting of the auditor to make the external audit, in order to verify wether the QMS of the company is in accordance to the ISO or not. It's definitely a pity, because if those organization really took it seriously, more benefits they would conquer.

Some companies diving on the certification topic and they decide to obtain the 3 (three) most common certifications, which nowadays, we can call the 3 ISOS (9001, 14001 and 45001). When it occurs it said that the company got they IMS (Integrated Management System), which is the combination, at least, of those 3 (three) certifications. And, in some cases, much more than those. In the last years many companies decided to implement the IMS for the same usual reason: "*my competitor has it, so I need to get it too*".

In spite of being very useful for a company, when they really put those requirements in practise, we know that companies, in most of the cases, certify just to inform that now they have it and they expect to conquer new clients, target new markets, those commercial things we are used to hear. Unfortunatelly rarely companies really take those certifications seriously. And for those that, at least, try, they don't know how to manage it. For those companies which are trying to think about obtain those certification, I usually having the following advice: first get the most common one, which is, the 9001 and then, after a period of 2 (two) years, try to get the other which are missing. The reasons is simple: the company and the employees need to get use with a certification and understand how it works. If from the day to the night, the company decide to get all those certification, if they employees had already previous experience with it in other companies they worked for, it will be great. On the contrary, it will just make them crazy.

Below the table of variation of ISO 9001 certification between the years 2018 and 2019, we will have the chance to verify that the numbers of cerfications in some countries had an increadible increasing and in some other had significants decrease. The idea behind those numbers is not to identify the reasons on each country, otherwise it could consume lots of time. The idea is just represent the numbers and have a comparative in the measure of only 1 (one) single years.

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Position	Country	2018	2019	Variaton (%)
1	China	295.703	280.386	- 5,18
2	Italy	87.794	95.812	9,13
3	Germany	47.482	47.868	0,81
4	India	31.795	34.397	8,18
5	Japan	34.335	33.330	- 2,93
6	Spain	29.562	30.801	4,19
7	UK	26.434	25.292	- 4,32
8	France	21.095	21.696	2,85
9	USA	21.848	20.956	- 4,08
10	Brazil	16.351	17.952	9,79

Table 2: Variation of ISO 9001 certifications 2018 and 2019.
Source: ISO Survey.

From this table we can verify that Brazil, Italy and India are the countries where the certifications strongly increasing when it compared with the previous year. On the other hand, countriy like China, Japan, UK and USA the number of the certificates decreased. It would be necessary a further research in order to identify the reasons behind those decreases, which is not the main purpose of this master thesis, once right now we are just focused on showing the numbers of this certification.

Honestly, at least for me, it's a surprise to see countries like France, UK and USA, which are developed countries not in the first positions. Perhaps the companies

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located on those places have not much interestes on having the certification, but prefer working with a internal way to keep the quality. Now, let's see how was the worldwide situation with ISO 9001 certification 10 (ten) years earlier in the following table.

Position	Country	Number of certificates
1	China	328.213
2	Italy	171.947
3	Japan	56.912
4	Spain	53.057
5	Germany	49.540
6	United Kingdom	43.564
7	India	29.574
8	France	29.215
9	Brazil	28.325
10	South Korea	27.284

Table 3: Number of ISO 9001 certification by country.
Source: ISO Survey

From the **Table 3.** we could see that almost 10 (ten) earlier the countries are basically the same in top 10 (ten) ranking. The only exception was the South Korea which was replaced by the USA. Nevertheless, if we check out the numbers of certificates by country, we will realize that in pratically all of them the number of the certifications decreased. For example, China, which's in the 1st position in both tables. In the year of 2019 it says that there were 280.386 certified companies and in 2011 this number was 328.213, it means, variation of – 85% or reduction of 47.827 in the companies that for any reason decided not to continue with this certification. The same situation we can see in Brazil where the number was 17.952 (2019) and in the past it was 28.325, variation of – 63% or reduction of 10.373 companies which gave up of continue having with the certification.

It's difficult to explain the reasons behind each country regarding this lack of interests on to continue with ISO 9001 certification. Surely there are several reasons, for example, the costs involved, because as we have already seen, certifying a company

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costs money and depeding on the size of the organization it's not so cheap. Also some organizations realized it's not necessary anymore, because the customers are not requiring, because for some of them there are too much bureaucracy invoved, etc.,

In terms of Brazil, the country where I come from, the main reason behind this lack of interests of the companies in this certificion is due to the giant Brazilian company of oil, gas and energy called Petrobras. This company belongs to the Brazilian government and until the years of 2012 it was one of the biggest company in the world, including having shares trades to be negoatiated in Dow Jones. After many cases of corruption involving mainly the last two Brazilian's President: Lula (2002 – 2010) and Dilma (2011 – 2016) the scenario changed a lot and unfortunately the company lost a lot in terms of value.

Most of the Brazilian companies wants to be a Petrobras' supplier. The reason is: if your company is able to work for Petrobras, your company is able to work for any other. That's how things goes on in Brazil. And to be a Petrobras' supplier one of the requirements was that the company (which wanted to be the supplier) was certified in the ISO 9001, if not, there will be no deal! However, along the years they realized there was too much bureaucracy involved and only giant companies were able to gain contracts with the main Brazilian company. So, thinking also in the smaller suppliers, the Brazilain politics voted new laws in order to remove some exigences to be a Petrobras' supplier. And one of those requirements is the extinguishing of having the ISO 9001. Because of that the number of certifications decreased a lot as we have already seen in the previous table and again we will have the chance to take a look in the following graphic.

Still mentioning the topic of the certification, the tendance of the companies certified by ISO 9001, at least, in Brazil tends to continue decreasing due to this flexibility of Petrobras. And, being really honest, although this certification is really importante and have some many requirements, the smart companies have already notied that they can a QM and Management without the necessasity of having this seal. This is more a comercial stuffs than something else. Let's see the increasing and decreasing of those certification in Brazil along the period of 10 (tem) years.

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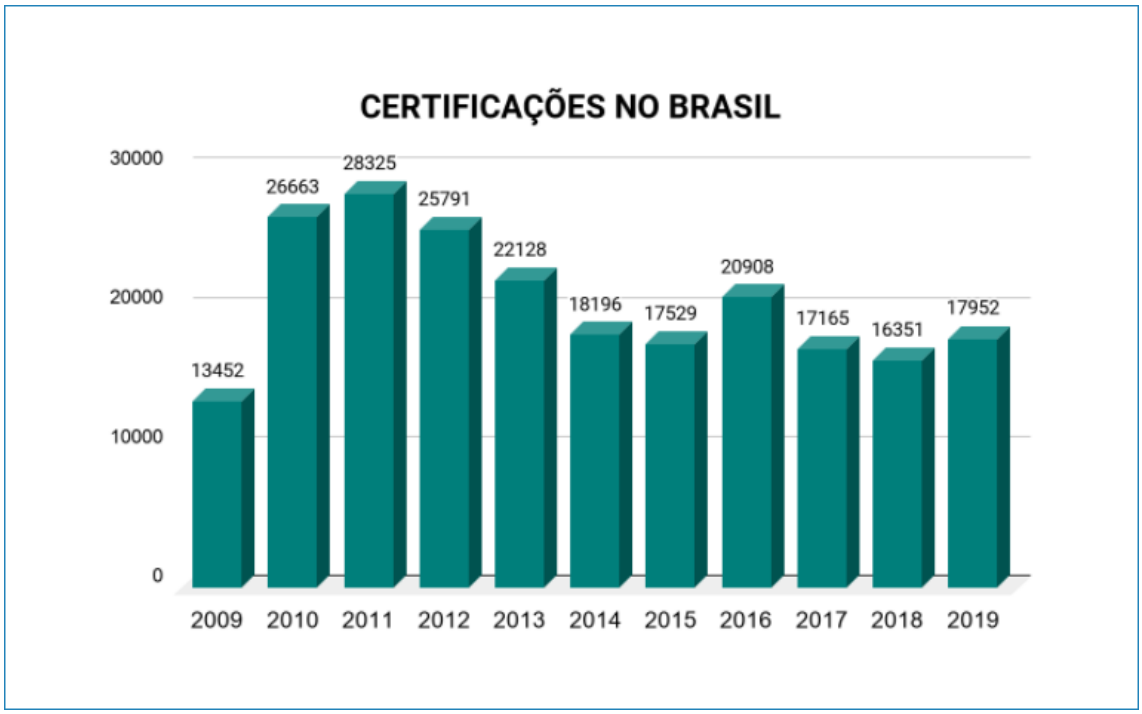

Figure 25: Number of companies certified by ISO 9001 in Brazil (2009 to 2019).

Source: ISO Survey

From this graphic extracted from ISO Survey, avaible in their website, which means, Certifications in Brazil, it's possible to notice that the number of companies which were certified between 2009 and 2010 almost double their size. The reason for that was that Petrobras had informed that starting from the year of 2010 only companies which had this certification would be able to have contract with them. And, around 5 (five) or 6 (six) years later they changed their mind and informed it was not necessary to have the certification anymore in order to be their suppliers or having any kind of trades with them. It explains the reason behind those numbers of decreasing.

For provinding services to Petrobras the ISO 9001 is no longer required from the suppliers, since in their understanding a company may have a QMS without the necessity of having a certification. On the other hand they require the certification when a supplier is a manufacture of products. In their understading, as they work with specifical criterias and as they oil & gas industry is so restricted, they must require this certification for products, because it may interfers direct in their projects.

We discussed a lot about ISO and their benefits. The main idea of the topic was if this certification was enough to solve all the internal problems. Honestly it's not

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enough to solve all the problem, although there are some advatanges on having a company certified on it. Thereby, following the same oppinion of Petrobras, a company may have a QMS without they need of a certification. Companies should only think about certifying themselves once they have in mind the culture of Quality and Continuous Improvement, unlike the companies will have just a certification which will have no internal meaning at all.

Thus, it's not necessary for any orgaziation having a ISO 9001 certification if a customer does not require. In my personal oppinion, the best to do before thinking of having it, it would be doing the standardization in the company with the work labors the company has avaible. Because as we have already seen everything in terms of Quality converge into the increasing of productivity, reducing of cost and continuous improvement.

The ISO 9001 or any other kind of certification consumes times and money from the organizations. So, if you are working in a company where the leaders decided to implement those seals of quality warranty, first of all you should ask them the reasons behind those certifications. Once you understood why they want that, it is your time and Quality Manager or Consultant to provide them informations about those certifications. Try to convince them that the priority it would be providing internal consultancy of QM and put in practise some theories, such as: 5S, FMEA, etc., only after that when the company has the culture of quality then it's time to think about certifying with ISO.

The reason behind this idea is simple: when the company decides to implement the ISO 9001, they will have to do all those works of consultancy together, of course, for those companies which does not have it implemented. On the other hand, why would you spend all this money with an external consultancy to do something that should have been done before? Then, my suggestion is: put in practise all those theories which have already been shown and after that think about certifying the company. Doing that the company will not take years to get the certification, but maybe a couple of months. All because you anticipated the measured that would be taken. Unfortunately in general the companies usually prefer to do everything from the zero point, which is a completely mistake and waist of time and money.

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4. Continuous Improvement (Kaizen)

"Continuous improvement is better than delayed perfection". (Mark Twain)

In this previous chapters we saw the step-by-step about how to standardization a company. Officially this project would have the end in the results which were monitored by KPIs, right? The answer is no. Now it's time to put in practise the Continuous Improvement methodology. Remember: there will never be a perfect procedure, process, objectives etc., but they must be improved from time to time, just like we have already seen in this thesis.

Continuous improvement is the practice adopted by several companies to fill their increasingly better, more efficient and effective, whether in products, processes or services. It's an endless cyclican process, after all, there will always be new opportunities for improvement to be identified and put into practice. It's always possible to improve something, I mean, not only necessary in the business word, but also in your personal life. For example: managing your finances, choose the best way to go to work, how to obtain a better grade at your studies, etc., in a short explanation, Continuous Improvement is the search for perfection. This concept is also known as Kaizen

Kaizen was originated in Japan, shortly after WWII. It gained great popularity along the years in the production sector and became worldwide popular through Toyota growth from a small car manufacturer into a one of the largest worldwide car manufacturers. As we know, Japan is an island, and after the war the country was totally destroyed by the bombs from USA and their allied group. They were totally demage in terms of infrastructure. It was necessary invest time and money to rebuild their: port, roads, airports, railways, etc., and being an island the situation is more critical because as anywhere the resources are limited and when your country is geographically isolated, then the situation is even worst. But, in this concept, the Japanese created several concepts and methods with the mentality of zero waiste. And many of those contribution we are still using in the 21th century almost 80 years after the end of this tragical episode o four history.

For understanding how is Kaizen or Continuous Improvement in practise, basically let's see this sentence: "today better than yesterday, tomorrow better than today". For Kaizen it's always possible to do something better, no day should pass without any improvement having been implemented, be it in the structure of the

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company or in the individual. Its methodology brings concrete results, both qualitatively and quantitatively, in a short time and at a low cost (which consequently, increases profitability), supported by the synergy generated by a team brought together to achieve goals established by company's management.

Kaizen is a Japanese word that means change for the better, used to convey the notion of continuous improvement in life in general, be it personal, family, social and at work. Kaizen is based on the elimination of waste, based on commom sense, on the use of inexpensive tools that support the motivation and creativity of employees to improve the practise of their processes. In the business context, kaizen is a methodology that allows the company to lower costs and improve productivity. There are specific skills, behaviours and action that need to be developed so that improvement is sustained over the long term, requiring continuous improvement. Thereby, the involvement of all company's employee is essential in kaizen, since it's a methodology that does not focus on the top managers.

All the aspects related into the manufacturing process of a product or delivery of a service has its importance, since when it's looked for better results and reduction of wastes, each detail is relevant and it must be improved. And on those few details that can be improved that the efficience will appear.

It's necessary that the organization do not limit efforts in the search for better results. With often changes in the market each time stopped can represent major waste and can also result in lost of customers and market share. It's also important to note that Kaizen philisophy begins with the Discovery of existing problems in the process and the small improvements in activities carried out by operators. Always taking into account the standardization of activities.

Thus, as we could notice through this first part is that kaizen is not more than just a simply way to say: gain efficience. The capitalist system basically "forces" the companies to be more efficicence, on the other hand, they are not going to be competitive and as it was mentioned before in this work, not competitive companies tend to disappear, or, at least, to buy incorporated by a bigger group, which's going to buy them and, consequently, get their customers and their knowledge. Then, it means, daily the direction and owners are trying to target new strategies in order to make the profit increase much more than yesterday, much more than a month ago and much

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more than it was in the last years. It's not so easy task doing that, however, to keep the company working and to keep the jobs it's necessary those strategies.

In the context of Lean Methodology, the continuous improvement seeks to improve each process in the company by focusing on the development of activities that add more value to the customer, while removing the largest possible number of activities that generate waste. Some authors considere 3 (three) types of waste. They are:

- Muda: which is also known as the seven wastes;
- Mura: which would be the waste of inequality;
- Muri: which would be the waste of overload

Comment the first one (Muda), the 7 (seven) wastes of the process are: transport (logistics), inventory, handling, waiting, over-production, over-processing and defects.

The complete removal of all of them is almost impossible to happen, but focusing on minimizing the negative effects on the work is crucial to the successful implementation of the continuous improvement.

Mura is caused by inequality or inconsistency in its process. It's responsible for many of the 7 (seven) Muda's waste. Mura prevents the tasks from flowing smoothly through the work process, and, therefore, hinders the continuous flow.

Muri is a big problem for the organizations that apply the push system. When a Manager delegate lots of work to his team, this professional adds unnecessary stress to both: the team and the process itself. Muri is usually a result of Mura and if the organization wants the continuous improvement to become part of the culture, it's need to focus on eliminating these wastes.

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4.1 Managing the process

"If opportunity doesn't knoch, build a door". (Milton Berle)

Once understood the meaning and the concept of Continuous Improvement, let's check it out some examples to understand how the government and companies put them in practise.

Let's think about the President or Premier of a determinated country. This authority, which in great part of the world is elected by the population does not manage the country along, but with the supportal of Ministers. There are several Ministers which provides guidelines in order to help the President to govern his / her nation, for example, Minister of Economy, Minister of Interior, Minister of Defense, etc., now, let's think about the Minister of the Economy. This person is in charge to identify improvements and suggest his boss, which in this case is the President, changes in order to make the country increase their GPD, control the inflation, lower taxes in oder to help more jobs to be created, assist in creating laws or simplifying taxes, organize the exchange rate issue and many other activities. Obviously the Minister of the Economy will not do all those stuffs alone, this authority will have a group of employees working for him / her, however, when the ideas go into the public, this authority is responsible for the communication among the population.

It's year of election and the President is thinking about his re-election. So he proposes to the Minister of the Economy to find a sollution for increasing the jobs, because the main leader of the nation believes that his low popularity is due to the high level of unemployment. Then, the Minister will have the hard task to observe together his team how they can do it. Maybe reducing taxes for small companies, maybe renogociating debts of the companies and inform them to pay in the next years, maybe investing more in education. There are several ways for them to do that, however, in the contexto of government is much more complex than in a company.

Now that we have seen how to make the continuous improvement in the public sector, let's see also in the business world. Let's suppose the CEO of a determinated company informed to his subordinates that for the next year the strategy he wants is: a increasing of 10% in the revenue in compare to the last year. What do you think? Is it a easy task? Definitely not, right? Nevertheless, it's possible or even possible to overtake this goal proposed by the CEO. First of all, it's more than obviously to us,

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but it will be only possible for those organizations where exists process. Without processes it almost impossible to find out the needed improvements in order to achieve this goal. Some strategies we could mention for make this reality come true:

1. Review the processes: in cases that the company realized that there are too much re-work in the products / services;
2. Training the collaborators;
3. Target new customers;
4. Invest more in marketing;
5. The price: maybe it's too high for the customers and it could be reduced a little and then customers would consume more;
6. Is it sasional product (consumed only on summer or winter)?
7. Is it necessary hire new employees ?;
8. Verify the necessity of buy new machines.
9. Try to renegociate better prices and better conditions of paymeny of raw material with the suppliers;
10. The economic situation: it can be a problem to increase the sales.

Those are some examples of strategies which a company could adopt in order to acheive the goal. However, even if they do all of this, it does not mean that they will be succssed. Especially if the economy goes bad just like nowadays with worldwide problem of coronavius.

Perhaps you have already noticed that in Quality everything converges into 2 (two) main words, which are: Process and Indicators. Those are the most important tools which helps any manager to understand his / her department and take decisions. Without those tools, nothing is true, but only personal oppinion.

Conclusion, for any company to achieve the goals delegated by the Direction, it's necessary to understand the processes involved, because is through this tools that the managers will have a better understanding of the company and the whole productive process involved. And also of KPIs, because this is the tools of controlling, of monitoring. It's through it that the managers will be able to explain, for example, to the high direction of the company that according to the historical scenario of sales, it's not possible to achieve that goal they proposed, because it may overload the employee and it may not be a intelligent strategy.

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4.1.1 We did not achieve the goal, what to do?

"Seek the truth, listen to the truth, teach the truth, love the truth, abide by the truth and defend the truth until the death" (Jan Huss).

For the good performance of any organization, it's necessary that each department has their own goals, but not only that, the goals must be achieved. The Commercial Department has the goal of keeping the customers and find new ones, the Sales Department to sell a number of products weekly, monthly or yearly. The Production needs to manufacture a number of products on time to atend the demand of the customers. Quality to verify if the products which were manufactured are in accordance to the customer's standards (or to the company's procedures). The Logistics must delivery the products on time to the customers, etc., each departments has their obligation in order to get the customer's satisfaction. That's the main reason of any company! When a department does not achieve the goal, then we say that a deviation, as known as nonconformity occured.

In the topic of KPIs we have already explained the importance of add goals to each department and often verifying if it's a suitable goal or not. Goals should be defined by the top managers and not decided by the employees in a conference. But goals might be flexible and it must be aligned with the capabilities of each organization.

For the companies which have very conservatives top managers they create difficult goals to be achieved, there will be a great chance that many products / services are going to be delivered with defection, because the employees will just want to produce to achieve the goal and not to follow the procedures. There will be a great chance that part of the employees are going to be injured somehow, through the consequecenes of overload work or, last but not the least, may happen demotivation among the collaborators due to not having achieved the goals and, doing that some people probably will start look for new jobs in other companies.

It's more than obviously each department must have their goals to be achieved and those goals must be informed by the Manager. In case this professional, who is the leader of the team, realizes that in somehow the goals are not being achieved, he / she must convice the top managers of of his organization and explain the reasons. Remember, always convince your boss through numbers, because that's what they

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want to hear, however, always have evidences and study the possible scenario in order to make your suggestion acceptable and try not to use your oppinion, otherwise you will probably receive several questions. In case our bosses are not flexible, the best to do is: keep quiet or look for another job opportunity. Always remember about the phrase of Jan Huss in the begining of this chapter. It might guide you to find out sollutions to your problems, in this case, among your bosses.

Thus, goals must be flexible. And the top managers must have in mind that if they don't do it, certainly their companies will never be competitive and the Turn Over indicators is going to increase much more than the revenues of the company. And this is one of the KPIs that should never be so high, because it monitors the quantity of people who are hired to those who are fired (or simply just quit their job).

The conclusion from this chapter is that we can take as learn we should always see the goals as something flexible and not only something impossible to be achieved. Unfortunately many worldwide companies keep on doing this silly mistaken of creating impossible goals to be achieved, because in the old-fashioned mind's of some top managers, those impossible goals are needed just to show to the employees that they are not performing in accordance to the expectations' of the company. Nevertheless, we have already seen what it causes. Thus, if you really want to be a great top leader, think about the goals and if you are suffering pressure from the Direction of the company, try to demonstrate to them that they are wrong in their analysis and convince them about what should be done at first and then the next steps.

Surely you will create more enemies than friends among the Directors and also within the Stekholders, but do not be aware of that. And, as a Quality Manager you have enough ability and capacibility to demonstrate to them that your theories are better than theirs, and demonstrate to them with numbers and graphys that if you follow their rules, maybe the company will not last for a long time, but for a few years, once many employees will decided to quit their job and who will wants to be a leader of a unmotivated team? I guess no-one, isn't that so? So, don't be afraid and negotiate and put your plans in practise.

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4.1.2 Is nonconformity synonim of failure?

"Anyone who has never made a mistake has never tried anything new" (Albert Einstein).

First of all what's nonconformity? This word can be described as deviation from of a deviation in the process, which can be identified by the company or the customer. And in some cases can be refffered to a deffect, in other words, it's failure on meeting a requirement. It might be a litte bit confusing, but it's not. Below the explanation of nonconformity for each cases:

- Specification: if the customer requires a blue car and it was produced a black one, then, a mistaken happened in the communication and for sure the customer will not want this vehicle;
- Standard: if a bottle of soft-drink must contain 500 ml of drink and some bottles were produced with 600 ml, then, a mistaken happened and those bottle can not be marketed;
- Expectation: the customer bought a new mobile expecting the camera would be great, since it's a new model, but it was not. Then, in this case, it's a mistaken as well, because the company before lauch a product in the market, they should make a survey to understand the customer's need.
- Defect: the product was damaged delivered to the customer and consequently the customer will complain about it.

Those are the most commons examples of nonconformities. Nevertheless, there are also the nonconformits applied to the departments, in this case, the goals which the top management proposed to each of them, which we have already seen in the previous chapter. When a nonconformity occurs, don't worry, because it is not be the end of the world. Many people are afraid to get a NC, because they believe they are going to lose their job, but this situation is more than normal to happen than we think. And, in somehow, it's important that the appear from time to time.

Why is this important? Because it's a chance for the company (also the employees) to learn something new. Learn from the mistaken, analyse what caused, correct the mistake and training the employees for not commit this same error once again. When it happens, usually the Quality department acts in order to verify the circumstances and makes a report of it. Then, a employee from this department will

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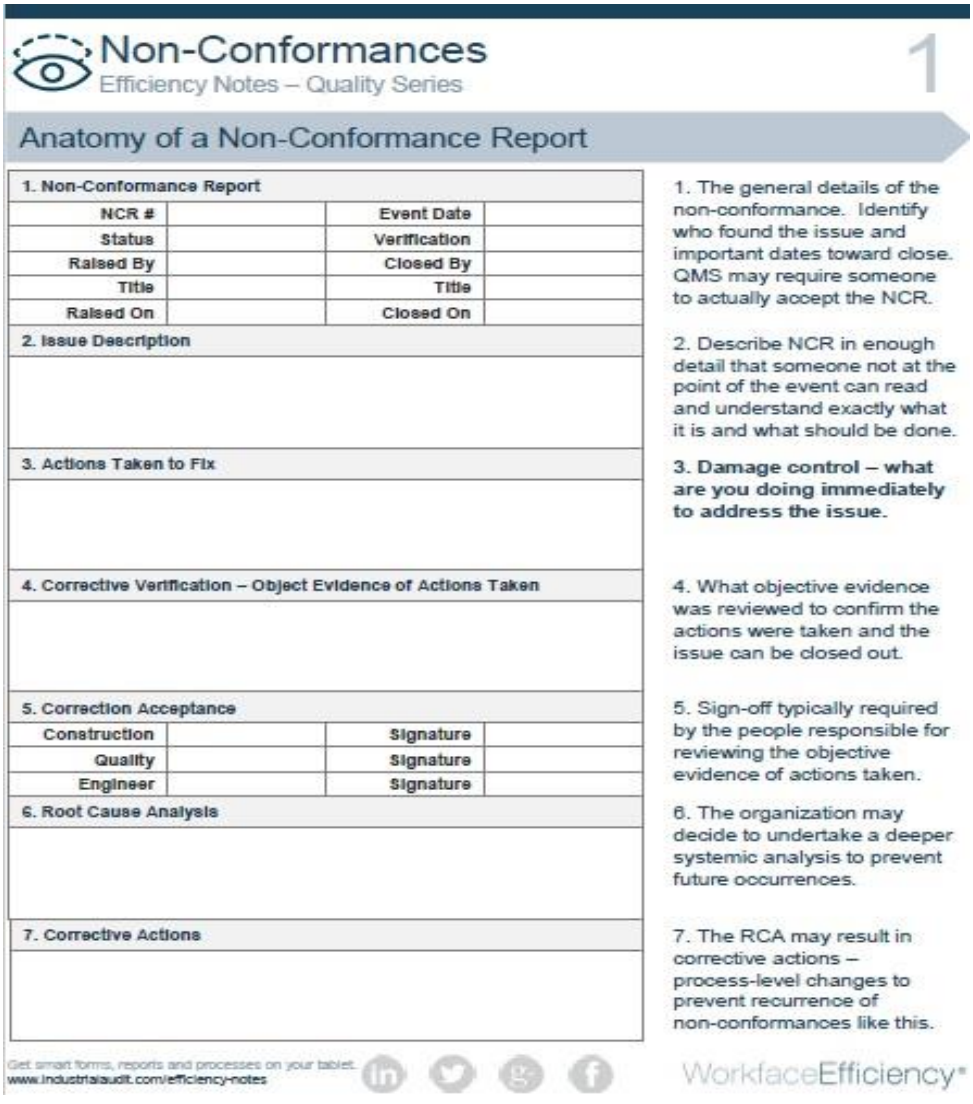
provide internal consultancy informing the changes that were chosen for not having this same nonconformity anymore.

Due to the great quantity of companies which have (or had) ISO 9001, they are used to the principle, because that's one of the requirements of this standards. And ISO 9001 standards does not inform how the company has to treat the nonconformity, but it says that it must be done. So it's up to each organization the strategy they will decide for make the treatment. Likewise, this standards informs that all nonconformits must be reported. Again, it's up to the company to decide: in papers, in electronic ways, etc.



Non-Conformances
Efficiency Notes – Quality Series
1

Anatomy of a Non-Conformance Report

1. Non-Conformance Report			
NCR #		Event Date	
Status		Verification	
Raised By		Closed By	
Title		Title	
Raised On		Closed On	
2. Issue Description			
3. Actions Taken to Fix			
4. Corrective Verification – Object Evidence of Actions Taken			
5. Correction Acceptance			
Construction		Signature	
Quality		Signature	
Engineer		Signature	
6. Root Cause Analysis			
7. Corrective Actions			

1. The general details of the non-conformance. Identify who found the issue and important dates toward close. QMS may require someone to actually accept the NCR.

2. Describe NCR in enough detail that someone not at the point of the event can read and understand exactly what it is and what should be done.

3. Damage control – what are you doing immediately to address the issue.

4. What objective evidence was reviewed to confirm the actions were taken and the issue can be closed out.

5. Sign-off typically required by the people responsible for reviewing the objective evidence of actions taken.

6. The organization may decide to undertake a deeper systemic analysis to prevent future occurrences.

7. The RCA may result in corrective actions – process-level changes to prevent recurrence of non-conformances like this.

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Figure 26: Template of non-conformit.

Source: https://industrialaudit.com/non-conformance-report/

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The previous picture above it's a template of how the organizations normally register the nonconformits that were detected. When it happens, it must be doccumented somehow by the company and there will be a deadline for the treatment of this deviation. And one of the documents required by the ISO's auditors is verying those NC and the treatment it was given and the results.

Usually the Quality department also monitoring those NC through KPIs, because let's be honest, who is going to check out a papper in the 21th century? One of the advantages brought by ISO 9001:2015 when compared to the old version (ISO 9001: 2008) is that through this standards is no longer need to have papers. However, it was not written it was necessary to have it, it was a commom practise having. And in the new version it's clearly said "documented information", so, it means, the papers do not need to be printed anymore.

From the previous chapters we can easily answer the question that starts in this chapter, right? The answer is no. Nonconformities are extremelly necessary to any organization and once you have it, it's time to put in practise the continuous improvement. Nonconformities not only represent a change in a organization, but also may save lives and we will see how.

People created this idea in their mind that this word is synonim of failure / unsuccsseful. Those people who think like that are the same people who think that Quality is synonim of durability or expensive product. If you ask 100 people if a Ferrari has Quality or even if this car has more quality when we compare to a Volkswagen, surely 99,9% of them will respond "yes". Although it's obviously they will not know the real reasons for it and there will be several answers. They will inform that because it's a nice car, because it's expensive, the traddition of the trade mark, etc., just like we say in Brazil: "they will go to the moon and return" and won't provide a properly answer. And as we have already seen through this work, it's not true. Quality is up to the customer's observation.

Back again a little bit in the previous chapter, we can also mention nonconformit in terms of goals that a department of a company did not achieve. For example, the Production department is in charge to manufacture 100 pieces of pipes. However, this department was able to manafucture only 70 pieces. Then, a nonconformity must be open in order to understand the reasons. The Quality team opened an investigation and they realized the following mistakes:

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- There were not enough raw material avaible in the stock;
- The materials purchased by the Purchasing department were not in accordance to the company's requirements;
- There was a machines which was broken;
- There were so many new employees;

This was the conclusion of the Quality team. In the case of raw material, it's necessary to review the Purchasing process and verifying the capacity of avaible space in the company and how much stock can support. Also it's necessary check it out the pieces which are more required, because those can't be missed as they are so important to the production.

The Purchasing department has already been informed about too much nonconformits. The Manager from this department must explain the reasons why his / her department is not buying the pieces in accordance to the company's requirement, once it's written through a SOPs the process of how to do it.

About the machine which was broken, the Production department has already reported it. Nevertheless, the Purchasing department together the Financial were taking too much time to decide if they should buy a new one or make a repair on it.

Last but not the least, new employees were hired in order to give a chance to half of the team to have holidays. Those guys had not much time of training and they were afraid to commit any mistaken and the Supervisor was often on conferences with the Manager and customers.

Through this overview we could see that there were so many mistakes and the failure was not all concentrated in the Production. Thus, they should not suffer a penalty alone for it, but all department have to. In this case, if the top managers really understand about management, they should not insisting on 100 pieces to be delivered, but they should decide for another goal. For example, 80. And those leaders must have in mind that each goal must have tolerances from plus to minus, it means, if the goal is 80, the tolerance of production must be something around ± 10% (just supposition). Thus, the maximum production the company could afford would be 88 pieces and the minimum production must 72 pieces. Less than this number the department will get a nonconformity. In spite of overload production appears being a good business, it's definitely not, because it means, manufacture product in the stock and the synonim of it is: waste of money.

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Everytime a goal is not achieved for any reasons an investigation must be made by specialists. Remember every nonconformity is a chance of learning something new and it makes part of continuos improvement. Although this word may sound not good to everyone's ears, they are essential to the better development of each organization. Mainly in multinational companies, there are groups focused on looking for them and for those employees who did not bring, at least, 2 (two) NC, this employee will have his / her worked reviewed and get a grade from his contribution.

Thus, next time you are working for a company and you are informed your department or even yourself got a NC, don't be in panic, because when it happens it will be a time of changing and learning something new. Let's imagine how many air crashed have already happened along this almost a century the humanity have airplanes? Each accident the specialists make investigation, of course, the dive on it much more than in a company, and the make a report about it. Those reports are informed to the government and high court. New internations legislations are going to be created and procedures of security in order to the companies which produces airplane (and also their outsources) work hard and find sollutions for a new similar accident not happen. The same we can say about cars. Nowadays it's impossible think about a car without a security belt, right? Until the 1910's it was a normal to see cars without this equipment. And, because of this, many people died. Along the years, the automotive industry developed a lot and also laws having been created, in order to bring more security to the population. For examples, ABS brake, air bags, etc., now think of how many lives were saved due to those technological advances? Unfortunately some people have to die for the others to be protected. We hope it will never happen to one of us or neither to someone close, such as family or friends. Therefore, nonconformits are essential not only to the companies, but also to protect the humanity.

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5. Conclusion

"We think too much and feel too little. More than machinery, we need humanity; more than cleverness, we need kindness and gentleness. Without these qualities, life will be violent and all will be lost" (Charlie Chaplin).

Along this master thesis we could see many different ways in order to achieve the goals thourgh the eliminating of wastes on the producity process on the organizations. Several examples were provided to demonstrate how it would be in practise. Also many known methods used in term of QM were shown. The Quality System is a cycle which has no ending, but just improvements. The last technique which was invented surely it was the 6 Sigma and since then any other has been developed as far as we know.

For some companies quality is observed as something bureaucratical that only consumes times from the employees and it does not really bring serious results, when I mean seriously results, I'm mentioning the word "money", which we can also describe as profit. Companies think like that, because they expect the immediate results, but it will never happen like this so spontaneous, once it's necessary improving day-by-day this concept among the collaborators for the results become a reality. For example, if you have never done exercise before you will not be able to run 10 km, nevertheless, if you really want to be successed on it, you will need to prepare yoursel for achieve this goal and the same will be within the companies. The results will appear along the months or years, it will all depend on how efficient will be the Consulting provided by their employees or external Consultancies supportal.

There are no right nor wrong methods, since all of them looks for the same objective, which is: eliminating the wastes and increase productivity. Likewise, as we have seen, it's important that those employees who will be in charge of putting those concepts in practise in any organization, they need to have previous experience on this field, otherwise the required results will probably not become a reality. And as we know, there will be always a group of people who will be waiting for the failure, just to demonstrate they were right in their oppinion.

It's obviously that the company does not really need to take into consideration all those concepts which were presented in this work. The idea it was just showing them and how they can contribute to any organization. Which concepts the company will take, it will depend on their need and also on the own strategies. Those concepts

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have been used by the companies along the years, so they are efficient and there is no need to create something from the zero. Of course, if the company delegates you this task, it will be a great chance of learning and who knows to develop something so useful just like was the 6 Sigma when Motorola decided to invest time and money to create it? It will always a possibility.

The main idea behind this work thesis was demonstrating that for any organization performs well, it's necessary that they have standards in their process, because it's more than clear that those which do not have it, they just fail. Along those chapters we verified through several examples that the standards itself doesn't make any kind of change, since it's necessary a group of employees taking care of the Quality System itself. Nevertheless, for the best performance of the company it's necessary make several changes, from the leadership until the creating of standards, and, of course, implementing the continuous improvement everytime it's necessary.

Now more than never with this pandemic situation of Covid-19 that we have been living with since February 2019, several companies for surviving will need to be more and more creative, finding new strategies in order to exist, otherwise they will bankrupt and have to fire several employee. And, just like any economical crisis, where the Economist find sollutions, it will be the time for Quality Specialists provide internal consultancys for helping those organization, keep people employed and consequently maintain or even increase the value of the stock of the steakholders. It's possible make it comes true, even though it requires deep understanding and also experience.

Probably once in your life you have ever heard the following sentence: "*all the roads leads to Rome"*, in terms of Quality Management we can change a little bit this sentence to: "all the methods leads into the perfection". So it means: it does not really matter which methodology the company decides to put in practise, because all of them will provide the same result from different perspectives.

The Quality Mananagement it's like any other science which has no end. Right now surely the specialist are looking for ways in order to survive this economical crash due to covid 19, which no-one could predict before. What will come next nobody knows, however, maybe along the years we will certainly hear about other techniques or even methods which have been inventend on those crazy years of 2020 and 2021. And just like the 6 Sigma, which was developed in Motorola and nowadays it's a very

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essential tool to giant companies, surely those techniques will be the same in following years. Of course, if the companies really want to make it public.

Quality is not synonim of success, however as we have seen along this master thesis, it's justo ne more way to provide efficiency to the organizations to make things much better. Nobody wants to have wastes or additional costs at the company, because it means the company has serious problems which needs to be eliminated. The capitalista world is strong cruel to those companies, since those which have those problems they have the following directions: bankrupt or it will be incorporated by the competitor.

Last but not the least, just like any other department has its importance for the organization, within the Quality would not be different. And, if it was not for this department, certainly the companies would never understands where the mistakes come from and they would eternal blame the collaborators thinking they were doing mistake, where we know it's not true. So, for those people who are reading this work, don't give up, because this will be a eternal challenge to those people who work with Quality to convince the companies about this importance and how it can provides results, because once it happens, the companies and people will have the trust on you and when it happens, the sucesses will come. As we have seen this is called continuous improvement.

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9. List of Abreviations

AD ..... Anno Domini (After Christ)
BC ..... Birth of Christ (or Before Christ)
CEO ..... Chief Executive Officer
CFO ..... Chief Financial Officer
DMAIC ..... Do, Measure, Analyse, Improve and Control
EMS ..... Enviromental Management System
GE ..... General Electric
HO ..... Home Office
HSEQ ..... Health, Security, Enviroment and Quality
IAF ..... International Accreditation Forum
IMS ..... Integrated Management System
ISO ..... International Organization for Standardization
KPI ..... Key Performance Indicator
NC ..... Non Conformity
OHSAS ..... Occupational Health and Safety Assessment Specification
PPE ..... Personal Protective Equipment
QM ..... Quality Management
QMS ..... Quality Management System
ROI ..... Return on Investment
SOP ..... Standard Operating Procedure
TQM ..... Total Quality Management
USA ..... United States of America
WWII ..... World War II

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