

## Proposal to improve productivity for companies providing comprehensive automation and control services

## Propuesta de mejoramiento de la productividad para las empresas de servicios integrales de automatización y control

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### Abstract

The concept of productivity has evolved over the years to represent more than an efficiency index. From issues of cost and quality, its scope has expanded to encompass social concerns such as job creation, job security, poverty alleviation, resource conservation, social responsibility, to business excellence, governance and environmental protection (Referred to as Green Productivity). Today, other concepts of productivity that have evolved include social productivity and knowledge productivity. There are several ways to understand productivity, but there are at least two essential definitions that are frequently used and adopted today. Productivity is key to maintaining competitiveness, both at the organizational and country level, and to ensure sustainable socioeconomic development. The various productivity-enhancing tools, techniques, methods and practices that have been developed and adopted over the years in the production and consumption of goods and services are essential for the dynamism of economies.

### Productivity, Efficiency, Development

### Resumen

El concepto de productividad ha evolucionado a lo largo de los años para representar más que un índice de eficiencia. Desde cuestiones de costo y calidad, su alcance se ha ampliado para abarcar las preocupaciones sociales, como la creación de empleo, la seguridad laboral, el alivio de la pobreza, la conservación de los recursos, la responsabilidad social, hasta la excelencia empresarial, la gobernanza y la protección del medio ambiente (Denominado como Productividad Verde). Hoy, otros conceptos de productividad que han evolucionado incluyen la productividad social y la productividad del conocimiento. Hay varias formas de entender la productividad, pero hay al menos dos definiciones esenciales que se utilizan y adoptan con frecuencia en la actualidad. La productividad es clave para mantener la competitividad, tanto a nivel de organización como de país, y para garantizar un desarrollo socioeconómico sostenible. Las diversas herramientas, técnicas, métodos y prácticas que mejoran la productividad que se han desarrollado y adoptado a lo largo de los años en la producción y consumo de bienes y servicios son esenciales para el dinamismo de las economías.

### Productividad, Eficiencia, Desarrollo

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## Introduction

Output generally refers to the result, i.e. the total capacity of work that is delivered by a person or team in a given context.

Productivity, on the other hand, is about how the process and people get to that delivery. It is where you can look at strategies, structures and tools that enhance the end result through the action of your agents.

Productivity is the ratio of the amount of output (Goods and services produced) to the amount of inputs (i.e. resources such as labour, materials, machinery and energy) used in production.

### Productivity = Finished product/inputs

Productivity is concerned with the efficiency with which goods and services are produced and the value created by the production process. If a product is produced at the lowest cost with high quality and can be sold competitively in the market at a price higher than its cost of production, then its productivity level is considered high. The objective of productivity is to maximise output and minimise input.

### Productivity = Efficiency + Effectiveness

The other element of the productivity equation is effectiveness. This relates to the achievement of the objectives or desired outcomes set by the producer of a product or service. If customers are highly satisfied with the use of the product or service, this could mean higher revenues and repeat orders for the product or service. It could also mean a higher return on investment for investors and even a better image or reputation for the company or organisation.

### Impacto de la Productividad

Productivity is an integrated concept, a combination of principles from various disciplines such as science, engineering, economics, finance and psychology. Productivity improvements or enhancements are generally achieved through collaborative efforts that address specific problems affecting an organisation. In short, achieving improved productivity involves a managed and systematic process; it does not happen by chance or accident.

Improvements can be planned once at the end of a phased process, incrementally from staged initiatives, or in stages through breakthroughs or innovations.

This paper shares the knowledge acquired in the research on productivity and competitiveness, all the information presented here was compiled from different reliable sources in order to present a clear and complete work.

## Development

Pareto's Law applied to productivity

80% of the results come from 20% of the effort.

There is 20% of your activities that produce 80% of your results and vice versa.

In this case, improve your productivity by applying the Pareto principle:

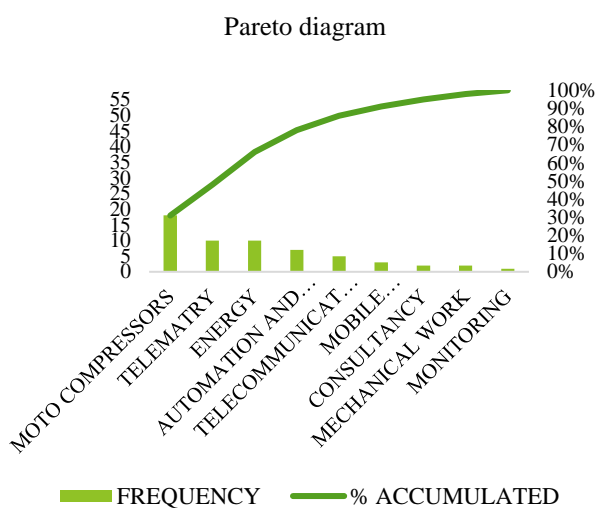
- Dedicate the best hours to those activities that produce 80% of your results. Personally, I dedicate the morning to working with my clients to get the best results. The afternoons can be dedicated to personal training on those days when we are not going to a talk or networking event.
- Dedicate 80% of the time to the most important activities. It is different from the previous case because many times an important activity is the one that avoids an urgent situation in the future. It does not generate a great (economic) result but, for example, it will be saving you a lot of time avoiding problems in the medium term.
- Prioritise the tasks and decide which one you will continue with. By detecting which daily tasks generate 80% of our income or results, we will be able to decide almost without thinking which of them we are going to continue with. Nobody in their right mind would procrastinate a task from the 20% group as these are the ones that generate 80% of your results.

**Results**

After collecting information from the top management of the companies about the services provided by the companies in the last 5 months, an analysis was carried out with the support of the Pareto diagram to measure and analyse the productivity of the services provided. The analysis and graphing is presented below.

Services	Frequency	Percentage	Accumulated	% Accumulated
Moto Compressors	18	31%	18	31%
Telemetry	10	17%	28	48%
Energy	10	17%	38	66%
Automation And Control	7	12%	45	78%
Telecommunications	5	9%	50	86%
Mobile Installations	3	5%	53	91%
Consultancy	2	3%	55	95%
Mechanical Work	2	3%	57	98%
Monitoring	1	2%	58	100%
	58	100%		

**Table 1** information analysis  
Source: Own Elaboration



**Graph 1** Pareto diagram  
Source: Own Elaboration

After carrying out the Pareto analysis, it can be seen that the services with the highest productivity index are the motor compressor service and the telemetry service, which are positioned with 20% of the productivity of the whole company, being the fundamental pillar for the company, with the highest number of services provided in the last 5 months, the rest of the remaining services are presented with 80%, thus becoming the services with the lowest productivity and the lowest requirement indexes. Proposal

The model presented for the improvement of the productivity of the company that is proposed in this work consists of a series of actions that will allow the better functioning of the organisation, all this with a systematic approach to achieve working in harmony and efficiently, all following the same goal.

It should be known that for a system to function correctly, entropy must be reduced, that is to say, all those aspects that generate wear and tear in our organisation must be eliminated or reduced, which can be due to both internal and external factors. This counterpart that aims to reduce entropy will generate homeostasis, which is nothing more than the harmonious balance in the company that in turn leads to synergy, or what is the same, the sum of all efforts; if the whole system works together harmoniously, with a close relationship between its elements and with predefined goals and objectives, it will achieve the proper functioning and the fulfilment of what was planned.



**Figure 1** proposed model  
Source: Own Elaboration

1. The most important work to be done within the organisation in a Thought Revolution is a trend that is currently being followed in many world class companies. Raising the awareness of staff at all levels of the company makes possible the unification and integration of all the human resources of the organisation, from the workers to the management.

This revolution in thinking aims to generate commitment among all workers towards the company, making all of them feel and be part of it, since it is a reality; it also encourages greater responsibility among the members of the organisation and promotes motivation among them. With all this, it is possible to start to generate creativity in people, which can be expressed through quality circles, in which ideas are presented, questions are analysed and the participation of the whole organisation is taken with a determined aim, the improvement of the company. If the company pays a lot of attention to these suggestions, in the end it will have committed people and, very importantly, it will manage the development of personnel and intellectual capital.

2. As one of the most common problems in all companies is leadership, measures must be taken to address it. In the Revolution part, the whole organisation is involved, including top management. Then, once the whole company is in sync, the only thing left to do is to appoint a good ship's captain, the sole administrator, who is the director of the company, must be the one to promote responsible work within the company together with the managers or those in charge of each area. Decision-making will be very important, so they must be cautious at all times in order not to fail and not to lose the trust they have with the staff. Always speaking the truth, being committed, listening to the voice of internal customers, being thorough and cautious, goal and objective oriented, high responsibility, orderly and with a tendency to plan are some of the many aspects that a good leader must cover in order to keep the company afloat and with the mentality of always looking for the best.

3. Teamwork is essential in all organisations as it facilitates the accomplishment of tasks, objectives and goals. Teamwork makes it easier and more possible to achieve success. Like awareness raising, it is not easy, but by focusing on what you really want, you can achieve anything you set out to achieve. Moreover, teamwork is the background for strategic planning.
4. Although the company does not have obsolete technology, it does need to be at the forefront of technology. We work with motors, compressors, telemetry instrumentation, so they are becoming more sophisticated and we must have the necessary tools to attack these new problems they may have. The trend is towards automation and the implementation of electronic circuits in the motor compressors, you must be aware of the changes that occur in the context, and have the ability to respond appropriately to these cases, obviously technology and staff training will be of paramount importance in this task. On the other hand, the implementation of technology not only helps in the mechanical area, but also in the administrative area, as it will speed up many activities. Also working on the website would be of great help for the company and it will be able to approach more potential customers.
5. Something very important in the organisation is the purpose, which refers to having the same goal within the company, but it is worth mentioning that the strategic plan establishes the ways of how we will reach that goal. When everyone works under the same motivation and on a specific goal, the sum of efforts is achieved and results are obtained.

In the end everything must be based on optimisation and learning, the result of our model will be an increase in productivity. All the above-mentioned points generate the necessary energy for the company to function properly and be productive.

We must be careful not to use more energy than necessary because we would wear out the system and increase costs, but if we do not use the necessary energy our system will not have enough response capacity and will fall into entropy.

### Conclusions

Productivity is, above all, an attitude of mind. It seeks to continuously improve everything that exists. It is based on the conviction that one can do things better today than yesterday and better tomorrow than today. Moreover, it requires endless efforts to adapt economic activities to changing conditions by applying new theories and methods. Measuring the practices we do today will help to improve the practices of tomorrow, that is the key, we need to encourage people to improve the things they do day by day, that is personal competitiveness. If a person is competitive, the company will benefit from that capacity in its staff.

Intellectual capital is the basis of any organisation, as are the clients, the goal is to obtain profits, the balance between both parts, money and clients, will determine the future course of the company. It is not possible to subsist only focusing on clients and leaving aside the economic part because the company will go bankrupt, but neither can it only focus on money because the company will not generate trust and client satisfaction.

A productivity improvement model must take this into account, the balance, our model puts forward this idea and from there it starts to propose the solution actions.

We can highlight what we consider to be the key points of the paper.

1. Whenever we seek to improve something, in any field, we must first verify that it is measurable.
2. There are many ways to evaluate the state of logistics in a company. The elaboration of a questionnaire is one of the easiest to carry out, however, one must be very precise when formulating the questions, so that the data obtained is as close to reality as possible.
3. The use of data processing tools such as Microsoft Excel and Microsoft Forms greatly speeds up the process of developing a project.
4. Improving logistics can be a difficult task if you do not have a good team in your organisation.
5. The implementation of Lean Manufacturing tools such as the 9s programme, Kanban system, Gemba and others would greatly help the improvement process.

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