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APPLICATION OF STRATEGIC MANAGEMENT USING THE PERT MODEL, BUSINESS PLAN CASE STUDY

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Abstract *In this research method for project planning applied to a business plan was implemented, which aims to optimize the evaluation of execution times in order to improve project planning and decision making. In which there is a poor management, during and after the project, therefore, this model allowed to coordinate a large number of activities and successfully complete the business plan in 22 weeks. On the other hand, it allows to graphically represent the different activities that make up the project and to calculate the execution times. Therefore, this model is designed in this way to visualize the importance of the interconnected tasks. According to this characteristic, PERT served as a valuable tool for managing complex projects, and the impact it has on the various actors involved. Thus, it made it possible to clarify the deadlines and the evolution of those tasks that are carried out simultaneously.*

Keywords: Scheduling, PERT model, productivity.

INTRODUCTION

Nowadays it is important to mention that a business plan must take into account the standard time frame in which the business plan is to be executed, and therefore, by having formalized and condensed this schedule will make it easier to concentrate efforts on deviations in the main management indicators before they reach critical conditions [1].

DEVELOPMENT

One of the most interesting applications of network theory and Gantt charts is to extend these tools to resource planning, i.e. to focus on fact of trying to estimate the critical path and duration of a program, respecting precedence relationships, with the additional definition and consideration of resources. In this respect, researchers have tried to provide different methodologies to find the optimal result. However, the task is not simple, and proof of this is that there are different heuristics, based on the theory of "trial and error", which do not necessarily guarantee the best or optimal result, but a "good result"; one of the known algorithms is Brown's algorithm that attempts to address this problem [2].

Objective: To optimize the execution time of a business plan project.

Specific objectives:

- Organize a detailed program.
- Simulate the effects of alternative decisions.
- Control execution times.

It is recurrent that many entrepreneurs, due to inexperience, make mistakes developing and writing a business plan and then do not understand why potential investors reject their plans.

The truth is that a poorly prepared business plan can be just as harmful as a total lack of planning.

It can lead to erroneous budgets that, in the long run, will be very costly and can also undermine the credibility of the entrepreneur in the eyes of investors interested in funding the project.

The purpose of the statistic is not to scare. The lack of an adequate and realistic business plan is one of the main causes of these failures, according to Shikhar Ghosh, a speaker at Harvard Business School in the United States. Therefore, knowing the common mistakes that new entrepreneurs make is a good measure. This way you can avoid mistakes made by those who have tried before and minimize the chances of failing in your future decisions [3].

Time for the preparation of a business plan

It is important to take into account that much depends on the size of the project, since it is the time it will take to complete the business plan, since it is not a simple document in which calculations and numbers are made, but rather it is the concentration of a certain amount of strategic, commercial, operational and human resources proposals.

Therefore, an entire logically designed structure has to be imagined and tested, and this may take a few days or several months.

A business plan has a fundamental purpose, which is to attract investors and convince them that the business project we propose is a unique opportunity that they cannot miss.

This would be the ideal goal, although unfortunately it is never that fast and we will need something more to convince the most serious investors. But it is also a perfect exercise for the project development team to define objectives, establish a schedule of milestones and anticipate the problems that are bound to arise.

Who can make a business plan.

It is commonly believed that only entrepreneurs of large companies should develop a business plan, given the high level of their investments, and that they should hire consultants or advisors to do so. However, it is vitally important that all entrepreneurs participate in the development of business plans, involving all members of their team, no matter how small the business may be. Do not hire consultants or advisors to do your business plan. You must know, believe and get involved with the processes involved in making a business plan [4].

Executive summary: It is designed to capture the interest of decision makers and should contain a brief summary of the main aspects of the business.

Strategic alignment of the business: The business plan must be coordinated with the company's strategic plan, so that a relationship can be established between its objectives and the company's general objectives.

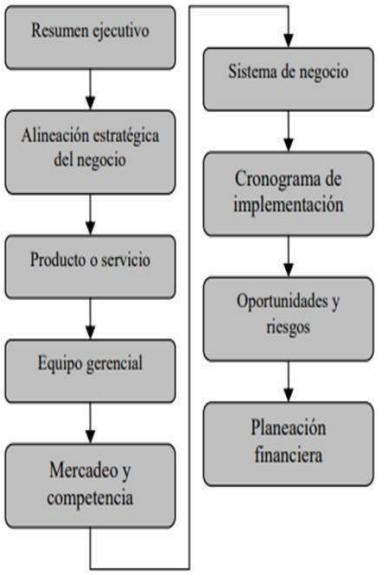

Figure 1. Elements of a business plan. Source: Arias, Portilla & Acevedo [5].

Product or service: The business plan is derived from an innovative product or service and the value it represents to the end consumer.

Management team: This part describes the strengths of the management team. When describing the skills you should be sure to identify those that are of particular importance for implementing your specific plans.

Market and competition: Understanding customers and their needs is the basis of a successful business plan.

Business system: Each business initiative is composed of an interrelationship of individual activities. When these are present and in relation to each other, a business system results. The business system establishes the map of activities necessary to prepare and deliver the final product to the customer.

Implementation timeline: Investors usually want to know your vision for the development of the business. A realistic five (5) years will inspire credibility among investors and business partners.

Opportunities and risks: The purpose of this exercise is to identify the margin of error for deviations from your assumptions. If possible with a reasonable effort, it would be desirable to have the optimistic and pessimistic scenarios from changes in key parameters.

Financial planning: Financial planning assists you as long as the business concept is profitable and can be financed. For this the results of the previous points must be summarized and consolidated.

Growth in value results from the cash flows of the operating business. These are relevant for business liquidity planning which also produces information on the financing of your business.

PERT Model

It is a very popular scheduling tool and is applied to know the optimal work paths**.** For example, if the deliverable of activity A is needed to perform task C, PERT will warn us that we must finish A before we start up C.

Pure logic that a priori should not have major complications. However, things get complicated when the execution of a single activity affects numerous activities.

PERT and CPM techniques help us to schedule a project with the minimum cost and the most appropriate duration, as Sinnaps does. With both techniques, the Project Manager will be able to find a compensation for the effort in his project.

Considering the activities that are not on the critical path, the team will work on these tasks when resources are available,

by leaving them at the service of critical activities in the most complicated phases of the process.

PERT elements

Gantt charts are a graphic system that is executed in two dimensions; on the abscissa axis the time is placed and on the ordinate axis the activities to be developed are placed.

Table 1. Elements of a PERT model.

Node	
Arrow	
Clearance	H= 0
Critical route	

This diagram is very useful for showing the sequence of execution of operations of an entire package and has the virtue that it can be used both as a planning tool:

1) **Optimistic time (t a):** This is the minimum time in which the task can be executed. For this time we imagine optimal conditions for its accomplishment.
2) **Most probable time (t m):** The time it would usually take to perform an activity if it were repeated several times (the mode). It is the time that is recorded most frequently when the task is repeated under strictly identical conditions. It corresponds to the top of the probability distribution.
3) **Pessimistic time (t b):** This is the maximum time it may take to execute a task when there are long delays and/or backlogs in the work, but which are not due to extraordinary factors. Expected time (t e): It is considered the expected time or expected duration. It is also called average time and corresponds to the point that divides the curve beta in two areas corresponding to 50%. This time is calculated:

$$te = \frac{a + 4m + b}{6}$$

Figure 2. Formula for calculating expected time.

Advantages and disadvantages of a PERT model

- Easy interpretation.
- easy programming.
- Enables decision making.

Disadvantages:

- The detail of the activities is usually very complex.
- PERT charts can be complicated and confusing with hundreds or even thousands of tasks and dependencies,
- PERT diagrams can be expensive to develop, update and maintain.

Planning has been multidisciplinary in nature and presents a mixture of perspectives and categories ranging from basic works, the nature of planning, methodologies and techniques used, the formulation of goals and objectives, as well as the models that are used to synthesize and describe some of the fundamental axes of planning. Planning has been applied in the areas of health, social policy and economic development with the objective of managing resources, fundamentally, mainly with a social purpose; however, although in the area librarianship it has been considered as important, it is necessary to delve from the perspective of strategic planning [6].

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Table 2. Expected time calculation. Source: Own elaboration (2019).

Elementos de plan de negocio	A	M	B	TE
A- Resumen ejecutivo	1	2	3	2
B- Alineación estratégica del negocio	2	4	5	3.83
C- Producto o servicio	3	4	5	4
D- Equipo de gerencia	2	3	4	3
E- Mercado y competencia	2	3	6	3.33
F- Sistema de negocio	3	4	7	4.33
G- Cronograma de implementación	2	3	4	3
H- Oportunidades y riesgos	3	4	6	4.16
I- Planeación financiera	3	5	7	5

Time to make a business plan:

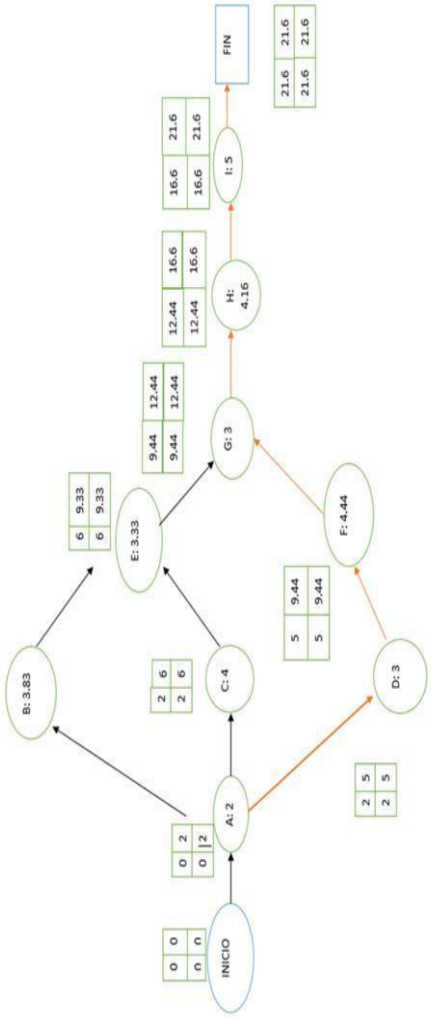
Depending on the size of the project, the time it will take to develop the business plan, since it is not a simple document in which calculations and numbers are made, but it is the concentration of a certain amount of strategic, commercial, operational and human resources proposals; therefore, a logically designed structure has to be imagined and tested, and this may take a few days or several months [7].

For this purpose, the expected time was determined as shown below:

Therefore, the time study is a procedure that allows the analysis of any manual method by breaking it down into the basic movements required and assigning to each movement a predetermined standard time based on the nature of the movement and the conditions in which it is performed.

When applicable and when used properly, the time study provides consistent results that are within the limits of what is more than acceptable accuracy [8]. Its applications vary from mass production of items to shop floor operations run for only a few items. Therefore, it is applied in this research to minimize process times on each machine by giving detail of the movements that operators execute [9].

While planning and emphasizing the PERT model.



PERT model applied to the business plan. Source: Own elaboration (2019).

The viability of today's companies (regardless of size, activity or sector) is determined by the ability of organizations to evaluate and react to their immediate results, seen in the context of medium and long-term strategic objectives. In other words, what is harvested today is the fruit of the work of a long time ago that was able to plan the conditions under which the crop we can harvest today would develop. Planning and measuring are fundamental elements for achieving results (consolidation and growth), which in a market economy translates into subsisting in a competitive, sustainable and sustainable manner.

However, the management culture, especially in medium, small and micro companies, has not yet adopted strategic planning and prefers the immediacy of results, neglecting the long term as a management tool (space/platform); in addition, there is little transfer of this knowledge to the members of the organization, including management and the sophistication that some consultants give to the subject, in addition to the costs involved in the market for hiring such services, which limits its application [10].

While a PERT model is strategy-based, it must contain the following elements.

Figure 4. UALAE methodology. La fuente & Marín [10].

Strategies

For a long time the term strategy was employed by the military as a way of designating grand plans in defense of what was considered a powerful enemy or opponent. It is "a company's overall plan for dealing with its environment and living within it" [11].

CONCLUSIONS

According to the critical path is: A, D, F G, H, I with a project completion time of the business plan of 22 weeks, which will allow optimizing time and money and eliminating everything that does not add value to the project.

RECOMMENDATIONS:

- Schedule business plan activities.
- Standardize project completion times.
- Work in advance.
- .

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