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# The importance of the strategic alignment process using Six Sigma projects

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## 1. Introduction

The administrative theories used in modern times invariably call for the need to implement improvements in companies. Whether prompted by customers or competitors, they are considered pivotal to the company's survival in an ever changing environment, which is currently the case.

An improvement alternative may result from programs that support competitiveness and organizational performance such as the Six Sigma Program. According to Santos and Martins (2005), the Six Sigma Program has been gaining ground in organizations as a quality program that promotes improving organizational performance, thus increasingly inserted into the strategic plan of organizations. According to Gerolamo (2003), for the improvement actions to be consistent with the strategy, it is necessary to unfold them and establish investment priorities in areas that advance the intended strategy. In Six Sigma, prioritization can be achieved by selecting Six Sigma projects, since this process directs the needed improvement (WERKEMA, 2004).

The literature, however, does not provide details on how the alignment between the Six Sigma program and strategy occurs, which is this chapter's main objective. Thus, this chapter proposes a systematization of the strategic alignment process for Six Sigma projects. There are several Six Sigma concepts. It may be a business strategy that seeks to identify and eliminate the causes of errors or defects in business processes, focusing on product characteristics that are pivotal to consumers (ANTONY, 2004). For Harry et al. (1998), Six Sigma is a business process that enables organizations to increase their profits by optimizing their operations, improving quality and eliminating defects. Harry and Crawford (2005) perceive Six Sigma as a tool that adds value to the product for customers. For Senapati (2004), Six Sigma is a process improvement method. According to Bisgaard, Hoerl and Snee (2002), Six Sigma is a business improvement approach by eliminating the causes of errors and defects in business processes and focusing on customer needs. Rotandaro (2002) adds that Six Sigma is a work philosophy to achieve, maximize and maintain commercial success by understanding customer needs.

2. Theoretical base: presentation of the models used

For the development of the aforementioned systematization proposal, the proposals of these authors were used: Gerolamo (2003); Werkema (2004), Kaplan and Norton (1990), Yip (1995) and Santos and Martins (2004).

2.1 Conceptual model for the improvement and change performance management process

This approach proposes a conceptual model for the management process of improvement and change performance. Once the model is unfolded, its main steps are described, illustrated in Figure 1, which can be divided into three key-processes: review; formulate and update the strategy; explain improvement actions and change; and assess and measure the organizational performance. This model’s main objective is to direct the improvement strength to the company’s strategic objectives

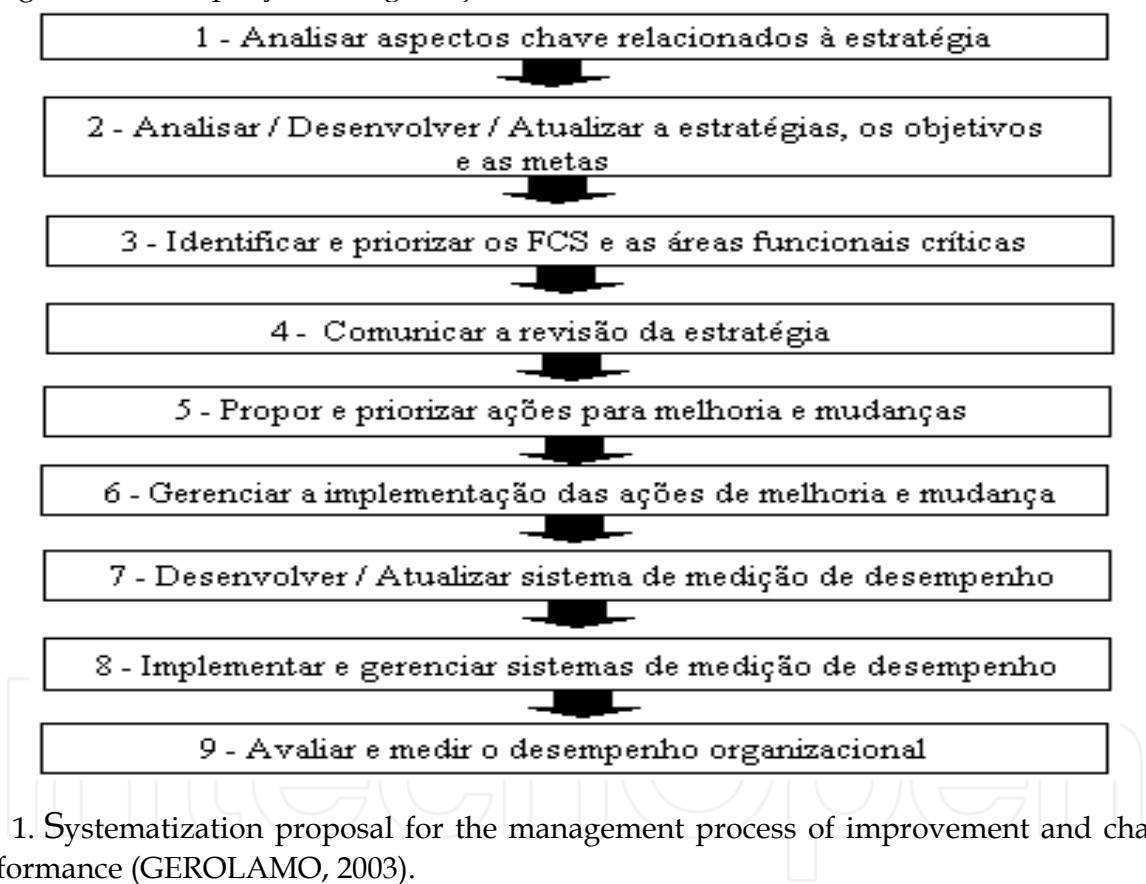


Fig. 1. Systematization proposal for the management process of improvement and change performance (GEROLAMO, 2003).

The first step is to analyze the key aspects taken into account when analyzing a strategy, so that the company in question is not taken by surprised by possible threats that may endanger its survival. They are key-aspect examples: the external environment (guidelines, laws, etc.); financial expectations of stakeholders; competitors; values and organizational principles; strengths, weaknesses, threats and opportunities; emerging strategies, etc. Next, the indicators and organizational performance data, strategic goals and the current organizational goals and outlooks are analyzed. The previous step feeds this process. From

this strategy analysis and the key aspects related to it, the critical success factors, the business processes and critical functional areas that are important to achieving the strategy formulated are identified and prioritized.

The next step is to design a plan to disseminate, communicate and implement the strategy for the different hierarchical levels of the company. To propose and prioritize improvement actions and changes, it is necessary to map the organization’s business processes, analyze process diagnoses and assess the current performance indicators. The subsequent stage is to manage the implementation of the improvement actions. To do this, the future business process should be validated and modeled; the actions implemented should be planned and detailed. Thus, a performance measurement system is necessary to support the transformation and to evaluate the performance of the improvement actions throughout the change.

The performance measurement system should be developed and/or upgraded. The organization’s current performance measuring system and its relation to the critical success factors should be identified in order to evaluate to what degree the PMS is supporting the company’s strategic objectives.

After this evaluation, the PMS has to be implemented and managed. Finally, the organizational performance, in which the company portrays its performance, should be assessed and measured.

2.2 Development of the Strategy



Fig. 2. Strategic planning model.

According to this model, the first step toward developing the strategy is to analyze and understand the company’s mission. From this understanding, a strategy consistent with the company’s mission has to be established, that is, a company that will accomplish its mission has to be established. After this step, strategic goals should be developed, in other words, separate the strategy into goals and define which indicators will measure these goals. Finally, it is necessary to develop actions to accomplish the strategy and, consequently, reach the strategic goals.

2.3 Balanced scorecard

According to Niven (2002), the BSC (Balanced Scorecard) can be described as a carefully selected set of measures derived from the strategy.

These measures represent an essential tool for managers to use when reporting the results and the behavior of the performance drivers to the organizations’ employees and stockholders, thus providing the necessary assistance for them to achieve the mission and strategic goals.

Kaplan and Norton (2002) define the balanced scorecard as follows:

[...] the “balanced scorecard” – is a set of indicators that gives managers a quick overview, but also comprehensive, of the entire company. The *balanced scorecard* includes financial indicators, which show the results of past actions, and supplements them with operational indicators for customer satisfaction with the internal processes and the organization’s capacity to learn and improve – the activities that drive future financial performance. (KAPLAN; NORTON, 2002)

Niven (2002) stresses that the fundamental problem is not developing a strategy but rather its implementation, by interpreting this strategy in such a way as to facilitate the understanding of all of the organization’s components, which may direct their individual actions to achieve the organizational objectives. Thus, the balanced scorecard is a strategic management method, which can be used for a long-term managing strategy, enabling critical management processes that are interconnected (as shown in Figure 3) such as:

- a) interpret the strategy of the business unit into specific strategic objectives;
- b) communicate the objectives and strategic measures to the company as a whole;
- c) set goals;
- d) align strategic initiatives (with quality) for extraordinary goals, and;
- e) improve feedback and strategic learning.

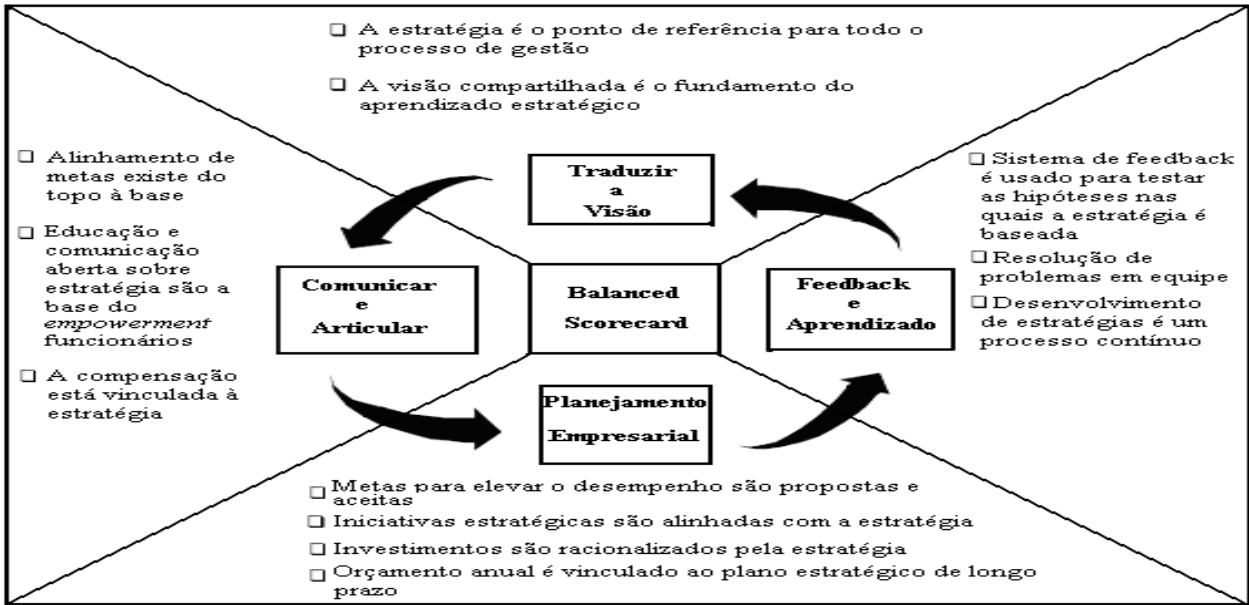


Fig. 3. BSC as a structure for strategic action. (KAPLAN et al., 2002).

2.4 Selection process of Six Sigma Projects

According to Pyzdek (2003), Arthur (2000), Adams et al. (2003), Basu (2003), Pande et al. (2001), Rotandaro (2002), Eckes (2001) and Snee and Rodenbaugh (2002), the selection of Six Sigma projects is pivotal to the success of the Six Sigma program, since well selected projects will contribute to the success and consolidation of Six Sigma culture within the company. Figure 4 shows the selection process of projects according to Werkema (2004).

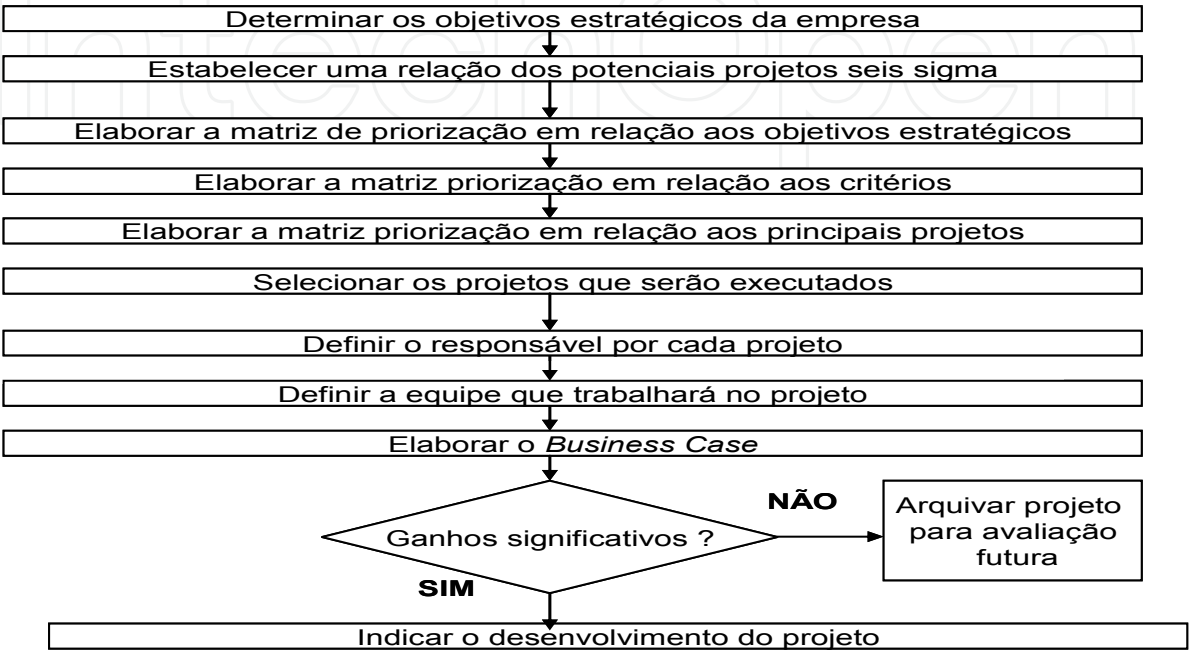


Fig. 4. Selection process of Six Sigma projects. (WERKEMA, 2004).

The first stage of the selection process of Six Sigma projects is to determine the strategic objectives decided on by top management. The projects should contribute to achieving at least one of these goals. Next, a relationship for potential Six Sigma projects should be established.

In the selection stage for potential projects, the management team holds brainstorming sessions in order to select projects according to the company’s current problems.

Once the potential projects are set up, the next step is to develop and implement the priority matrix for assessing the impact of potential projects regarding the strategic objectives (PATTERSON; BERTELS, 2003). An example of this matrix can be seen in Figure 5. For assessing the impact of potential projects on the strategic goals, one should first consider the extent to which each strategic objective is related to the project. Thus, a scale of 0 to 5 is established, where 0 means no relationship between the project and strategic goal; 1 means that the relationship is weak; 3 means that the relationship is moderate, and 5; the relationship is strong.

	Contribution to meeting the Cost reductions						
	Strategic Objectives	Reduced indicator			Characterization of the project		
		Reduced deadlines			Strategic objectives		
		Field references			Strategic impact		
		Servicing consumers					
					Deadline		
Caption							
The objective is:							
5- Strongly related							
3- Moderately related							
1- Weakly related							
0- Not related							
Number of objectives		1	2	3			
Weight of each objective (5 to 10)		10	7	6			
Potential projects							
Reduce by 50% client returns for packing problems Up to 30/10/05		1	5	3		63	3 MP
Reduce by 70% the rate of anomalies in imported Motors up to 31/12/05		3	5	3		83	5 LP
Reduce by 30% the cost of material purchased, Up to 21/12/05		0	0	5		30	1 MP

Fig. 5. Priority matrix to evaluate the relationship between the strategic objective and the projects. (WERKEMA, 2004).

For each project, multiply the resulting number of the intensity of the relationship by the degree of importance of the corresponding strategic objective and add the results of the multiplications. The result should be allocated in the “strategic impact” column on the row for the diagnosed project. Each sum must be transformed into a number on the scale of 0-1-3-5 and recorded in the “Contribution to achieving the strategic objectives” column. Finally, for each potential project, identify the medium-term (MT) or long-term (LT) duration.

The fourth step elaborates the priority matrix to select the projects based on the criteria to define a good Six Sigma project.

The method to establish the priority matrix is the same for the aforementioned matrix, however each column of the priority matrix to select the projects presents a criterion or filter that the company uses to define a good Six Sigma project. The degree of importance assigned to each criterion (scale of 5 to 10) is a consequence of the company’s strategies. Thus, for each project listed, identify the extent to which each criterion is met, using the same scale of prioritization matrix as above. For each project, multiply the resulting number from the previous step by the degree of importance of the corresponding criterion and add the results of the multiplications, recording this result in the column.

“Total”, in the row that corresponds to the project. The higher the number in the “Total”, column, the higher the priority of the project as a Six Sigma project.

2.5 Proposal of a model for strategic alignment of Six Sigma Projects

According to Santos and Martins (2005), the Six Sigma program has gained ground in organizations as a quality program that promotes the level of organizational performance and is therefore increasingly inserted in the strategic plan of organizations, establishing a link with the infrastructure that an organization has to measure performance. This often results in the program’s poor use, since any problem that may arise turns into a Six Sigma project, given that these problems could be solved with a simpler methodology.



To properly select the critical processes in need of improvement, in order to reach high organizational performance, is one of the primary challenges of Six Sigma (SANTOS; MARTINS, 2005).

Since the alignment is a key factor in the consistency of the proposals and actions given the improvement initiatives, the Six Sigma program is a catalyst for this alignment, since it is a strategic program that promotes the improvement of the entire business from the achievement of strategic objectives.

The selection and prioritization process of Six Sigma projects is directly related to alignment, that is, selecting the projects directs the improvement strength towards the company's critical processes.

Santos and Martins (2005) propose a framework that expresses the relationship of performance indicators with the Six Sigma program as a reflection of the strategic alignment. The structure is described in nine points:

- a) The organization interacts with the environment to define the strategy;
- b) Construction of the performance measurement system that is aligned to the strategy;
- c) The multiple categories of the performance measurement system direct the actions of the Six Sigma program by aligning the selection of Six Sigma projects;
- d) The Six Sigma projects should be aligned with the strategy through its objectives;
- e) The results from setting up the Six Sigma projects can promote improved efficiency and effectiveness of the company's processes;
- f) The Six Sigma projects may need a revision of its goals to achieve a greater alignment;
- g) The Six Sigma projects have a role as performance drivers through the link they establish with the performance measures that make up the performance measurement system;
- h) Customer satisfaction is achieved to the extent that goods and services are improved, and
- i) The successful implementation of Six Sigma projects enables an important strategic feedback in order to review the strategic objectives.

This structure demonstrates that selecting the projects has a strong relationship with the company's indicators and strategic direction; points three and four of this structure, previously listed. This systematization, however, does not describe in detail the selection process of Six Sigma projects, however, it details the unfolding of the strategy and the importance of its alignment with the Six Sigma projects, through the selection process of Six Sigma projects.

## 2.6 Considering the approaches

According to Gerolamo (2003), although the strategy issue is complex and depends on many areas and on a sparse literary source, it is important that organizations seek for methods to assist in their processes of analysis, formulation, development and strategy review. Then, the goals and strategic objectives are more likely to be achieved if the strategy directs the improvement strength, and the improvement strength in this article represents the Six Sigma projects.

Analyzing the proposed approaches on strategy development and strategic alignment, it is observed that the approach of Kaplan and Norton (1990) describes the unfolding of the strategy, but does not detail the alignment with the improvement strength, while Gerolamo's approach (2003) describes in detail the alignment of the strategy with the



strength of improvement without analyzing the development of the strategy. Yip' approach (1995) is simple and without many details. However, this work portrays the importance of having a PMS to motivate improvements in critical areas, which Werkema (2004) does not make clear regarding its use in the selection of Six Sigma projects.

Thus, a systematic method that presents in detail the strategy alignment with Six Sigma projects is justified.

### **3. Systematization proposal of Six Sigma strategic alignment projects**

The proposal presented here is based on the approaches presented in the theoretical framework, they are: Gerolamo (2003); Werkema (2004), Kaplan and Norton (1990), Yip (1995) and Santos and Martins (2005). The first approach mentioned presents a conceptual model on the managing process of change and improvement in performance, which for the most part lacks contextualization in the Six Sigma program. However, Werkema's approach (2004) does not detail the alignment process, but highlights its importance, thus showing a gap, which is the focus of this chapter. Kaplan and Norton (1990) make clear the strategy's development, but do not explain its alignment with the improvement strength, and as stated earlier, Yip (1995) presents an approach without many details. Thus, this proposal's major motivation is to join and/or adapt the aforementioned approaches by filling in the gaps, which is this proposal's differential, since it considers the strategy's systematic alignment (which the proposals of Werkema (2004) and Yip (1995) do not show) of the Six Sigma projects (which the approaches of Gerolamo (2003) and Kaplan and Norton (1990) do not specifically contextualize, taking into account the importance of selecting the Six Sigma projects). The proposals of Santos and Martins (2005) emphasize the importance of using performance indicators, but do not detail the selection process of Six Sigma projects. Figure 6 illustrates the systematization proposal.

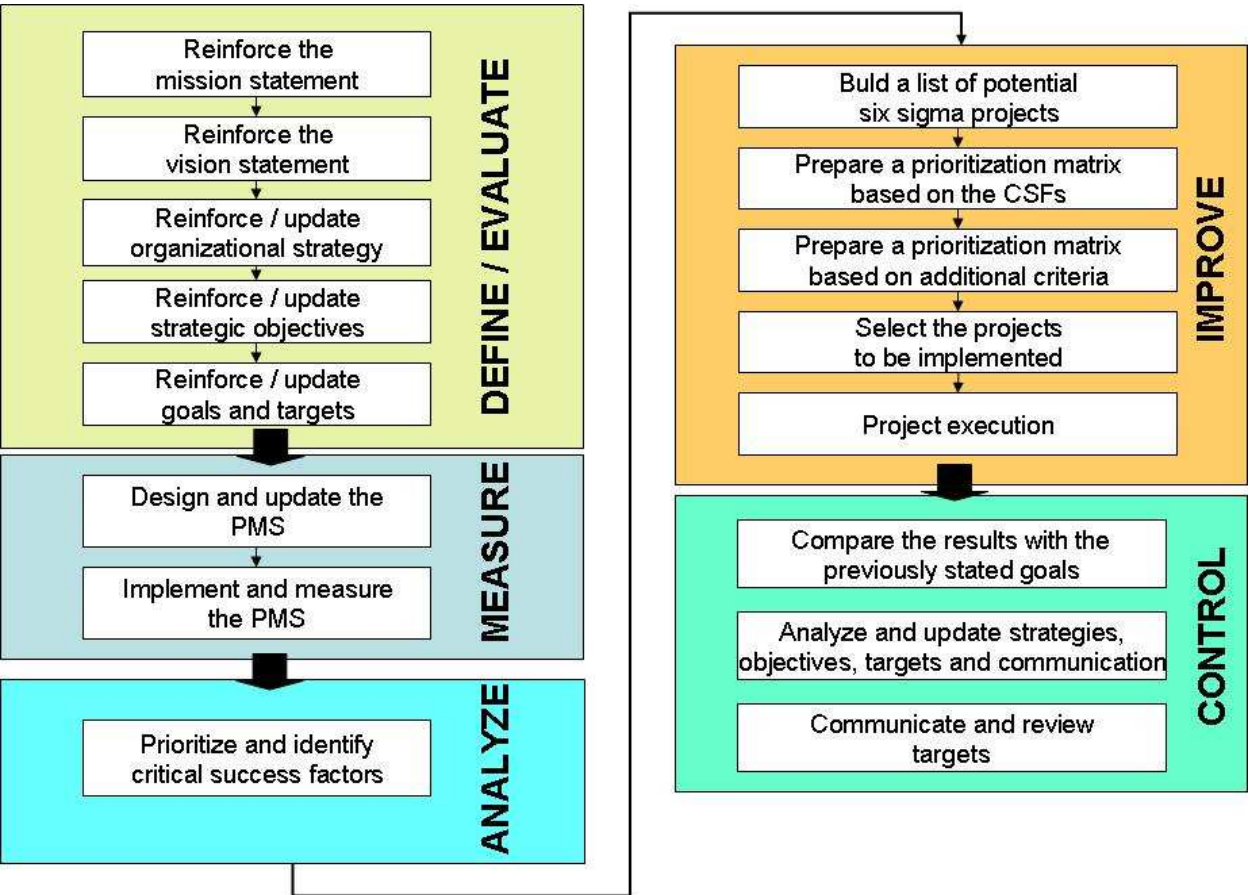


Fig. 6. Proposal.

Note that steps one, two and three are essential to implementing a quality program like Six Sigma, in other words, Six Sigma will only be successful if implemented in a company with a minimum of organization and maturity in relation to the strategy’s development, therefore, these steps will focus on the rescue and updating of the concepts presented and not on its development. It is necessary to emphasize that this study will not detail the process of defining the strategy, as this process is not part of the scope of this work.

1- Rescue/Upgrade the organization’s Mission

The first step in the proposed systematizing is to perform a rescue in the organization’s mission.

In this process, the company’s mission and updating the mission should be reviewed. Many misunderstand the nature and the importance of the mission, while others do not even consider it. Drucker (1973) observed: “The Company’s purpose and mission are so rarely considered, that this may be the main cause for many companies’ frustration and failure.”

According to Abrahams (1995), for a company to have a direction, not at the mercy of the erratic winds of fate, the mission should include the following concepts:

- The reason for the company;
- What justifies its existence;

It is a succinct and accurate definition of the enterprise;

It is defined based on cultural factors, formed by the set of beliefs and values of the company's personnel.

The mission of an organization can be defined as its primary function, preferably related in a sentence, clearly expressing why the organization exists (CHIAVENATO, 2004).

The essential business goals are involved in the organization's mission. The mission is the reason it is an organization, in which it seeks to determine its business. And each organization has its specific mission, from which its key organizational objectives derive (CHIAVENATO, 2004).

A company is not defined by its name, status or product; it is defined by its mission. Only with a clear definition of its mission will the company exist and make possible its clear and realistic goals.

Forming the identity of a corporation begins with the definition of its mission, the reason to exist. Every company, regardless its size, needs a mission statement as a source of direction – a kind of direction – that enables its employees, its customers, and also its shareholders to know what the company stands for and where to lead it.

## **2- Rescue/updating the Outlook and Strategy**

At this stage, the organization should review its strategy to rescue its outlook, in other words, the organization must analyze it and update it so that the company can view its current reality. A set of principles and beliefs should be obtained, which together with the mission statement, will help to achieve that outlook (CHIAVENATO, 2004). Thus, the outlook is the desired future state, related to the highest customer satisfaction.

From the rescue mission and organizational outlook, the next step is to review the rescue strategy. A well defined strategy that portrays the current organizational context is necessary in order to have an on-going six sigma program, because this type of program requires a well defined management structure. Then, at this stage the strategy should be examined, upgraded and developed (if necessary). Therefore, the key-aspects taken into account to analyze/develop a strategy should be examined, so that the company is not surprised by possible threats that endanger its survival. These are some key-aspect examples: the external environment (guidelines, laws etc.), financial expectations of stakeholders, competitors, values and organizational principles, strengths, weaknesses, threats and opportunities, emerging strategies etc.

## **3- Rescue/update of the organization's Strategic Objectives and goals**

The strategy should be developed as strategic objectives, that is, the organizations are goal-oriented entities. The strategic objectives are the organization's global and broad objectives. In some cases, the strategic objectives are broken down into operational and tactical objectives or into goals. (CHIANENATO, 2004). These goals should always be reviewed in order to achieve the organization's performance with regards to the objectives set in place, the review is conducted at this stage.

Thus, the organization must ensure that the strategic objectives:

Are related to the mission and understood and shared by the interest groups;

Are realistic and not overly ambitious. The most specific as possible. The strategic objectives should be described so that they can be understood and used by the employees (CAMPOS, 2002).

A goal, whatever it may be, can only be conceptualized when designed according to some variables (CAMPOS, 2002). Its objective goal should be well defined, given that the more specific the definition of its purpose is, the more directed its route will be. The goal must be quantifiable, becoming objective, palpable. A goal must be attainable, possible and viable. Moreover, the goal must be important, meaningful, challenging. A goal must be attainable, possible, and feasible. Finally, the goals must be well defined, measurable, possible, important and defined within a time frame.

It is necessary to rescue the goals, determine which were achieved and which will be achieved, and those that were not may then become the objectives of a six sigma project, since the goal emerged from the strategy's unfolding.

#### **4- Develop, update and implement the performance measurement system (PMS)**

By reviewing the previous steps, it can be stated that determining the strategic direction means creating the mission and setting the strategic objectives, taking into account the organization's outlook and values. Moreover, the strategic direction is related to choosing the right destination and path for the organization. This choice requires having a high degree of understanding of the external environment and a proper assessment of the organization's capabilities and competencies (GEROLAMO, 2003).

Once the strategy is chosen, it is necessary to choose the objectives and performance indicators that show whether the organization is in the planned path and through an assessment, how much progress was made toward the strategic objectives. Thus, the next step is to develop and upgrade the performance measurement system. At this stage the performance measurement system that will measure the degree of how much the organization is or not reaching its goals should be identified. At this stage, it is necessary to develop and upgrade the PMS so that it supports the company's strategic objectives. Thus, the relationship among the indicators, definition of objective measures, and identification of the conflicting indicators and the details of the indicators should be identified.

At this stage, the PMS must be operationalized, always seeking to validate the operation and periodically evaluating the PMS.

#### **5- Prioritize and identify the Critical Success Factor (CSF)**

According to Chiavenato (2004), the critical success factors (CSF) are the determining factors in achieving the organization's goals, and are directly linked to the company's success. There are two ways to identify the CSFs: the first one is to dissect the organizational resources and market to identify the segments that are most crucial and important. The second one is to discover what distinguishes unsuccessful organizations from successful organizations and analyze the difference between them, in other words, benchmarking (CHIAVENATO, 2004).

After identifying the FCSs, they should be prioritized.

To prioritize, it should be analyzed through the PMS, in which CSF the organization is unsuccessful and then focus on their improvement strength (BROWN, 2000).

### **8- Establish a list of potential six sigma projects**

Once the CSFs are identified and prioritized, a list of potential six sigma projects focused on the CSFs prioritized above should be established, that is, the six sigma improvement projects should solve the CSF problems.

### **9- Prepare a priority matrix with regards to the CSFs.**

This matrix is a tool to link the project to the company's strategic objectives.

### **10- Develop a priority matrix regarding the criteria**

This matrix relates the projects that passed through the filter of the previous matrix with the other criteria. These criteria are important features that projects have to have in order to be selected, such as the project's implementation period, ease of data, project cost, increase of customer satisfaction, availability of the personnel involved, financial return of the projects, etc.

### **11- Select the projects to be executed**

At this stage, the projects that passed through the filters of the former matrixes will be selected to be carried out.

### **12- Implant the project**

At this stage, the project based on the **PMSIC** methodology will be developed.

### **13- Compare the results of the projects with the desired goals**

At this stage, the results actually achieved are compared against the projects with the expected results during the planning and selection of the six sigma projects. Thus, this phase will monitor the project performance and project selection processes, that is, whether the organization's goals and objectives have been achieved through the results of the projects, this means that the projects were well selected and are actually aligned with the company's strategy.

The performance monitoring is the administrative process that ensures that what an organization is doing is consistent with what it decided to perform.

The performance indicators that comprise the performance monitoring should ensure this monitoring process.

### **14- Analyze and update strategies, objectives, goals and communication**

At this stage the indicators and indices of organizational performance, strategy, mission, outlook, objectives and current goals of the organization should be reviewed. The objectives and goals already achieved must be replaced or upgraded in accordance with the new results obtained with the six sigma projects.

The last step is to elaborate a plan of dissemination, communication of new goals and the objectives determined in the previous step.



## 4. Conclusion

Regarding the systematization proposal presented, one should emphasize the importance of having in the literature a systematic alignment of the strategy with Six Sigma projects, given that this alignment is essential to the success of the program. In addition, the proposal assists companies that are implementing the Six Sigma program to be successful in selecting improvement projects.

It was not within the overall objective to present a comprehensive proposal for all the improvement actions, the focus was on Six Sigma projects.

The alignment between Six Sigma projects and the strategy can be achieved through a systematized alignment process, which will maximize the success of the Six Sigma program, as presented in this chapter. For further research, the implementation of this proposal is recommended.

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If you do not measure, you do not know, and if you do not know, you cannot manage. Modern Quality Management and Six Sigma shows us how to measure and, consequently, how to manage the companies in business and industries. Six Sigma provides principles and tools that can be applied to any process as a means used to measure defects and/or error rates. In the new millennium thousands of people work in various companies that use Modern Quality Management and Six Sigma to reduce the cost of products and eliminate the defects. This book provides the necessary guidance for selecting, performing and evaluating various procedures of Quality Management and particularly Six Sigma. In the book you will see how to use data, i.e. plot, interpret and validate it for Six Sigma projects in business, industry and even in medical laboratories.

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