

**STABILITY INDICATORS: A TOOL FOR ORGANIZATIONAL PLANNING  
AND CONTROL IN CARBOCOL**

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## **ABSTRACT**

This paper discusses a methodology that helps to identify and measure Stability Indicators. Stability Indicators are used as a tool for organizational planning and control. A stability indicator is a measure of those organizational variables that are characteristic of the overall state of the organization. The organization is assumed to be stable when the organization is controlled; management plans are realized in practice.

The factors that motivated this research were the need for integrating the functions of planning and control and the need for flexible evaluation methods in organizations. The work uses systems, cybernetic, and strategic planning approaches as a theoretical framework.

The methodology was used in a project with Carbocol (The Colombian National Coal Company). Managerial ability has been strongly applied in order to learn from the company's past and present problems, and also as means of solving them. Arriving at the set of necessary indicators for control is the result of a learning process. Permanent feedback from the whole system helps to define strategies because it is characterized by a progressive knowledge of institutional learning programme.

## **I. BACKGROUND OF CARBOCOL**

The Colombian Government undertook the task of creating Carbocol in 1976. Carbocol's major objective is to finance a variety of activities in the coal industry, to give financial and technical assistance to miners, to improve their social and economical conditions and also to control environmental pollution. Carbocol could not be considered to be an isolated entity, but, rather, it is a dynamic organization taking an important part in the Colombian economy. Today it has had great social and economic effects on the country. Therefore, it is related to the other organizations which make up the country's economy; it is thus affected by the world economy.

Due to the last oil crises, the conversion from oil to coal created an enormous demand for the importation of steam coal. The crises helped new coal producing countries such as Colombia to obtain a foothold in the market. Indeed, the crises represented a great opportunity for Colombia as studies revealed coal deposits which account for more than 40% of the Latin American Reserves.

The methodology for the identification and measurement of stability indicators used in a pilot-prototype for the Central Cerrejon project was chosen. As an opencast coal project, it produces steam coal both cheaply and profitably. Carbocol managed the mine with a mine operator and commercialized the coal directly.

## **II. PROBLEMS IN PLANNING AND CONTROL AND THE NEED FOR STABILITY INDICATORS**

There are some issues which make organizing, planning, and controlling a firm such as Carbocol very difficult. These difficulties are essentially technical, financial and managerial. Among the technical problems we find, for example, the inexperience of Colombian executives in negotiating major technical projects, and the inexperience of Colombian engineering companies in dealing with major technical projects. Some of the important financial problems are mining projects representing long-term investments that make capital return rather slow, and the difficulty of predicting coal prices in the international market the face of hard competition. As regards management problems, the national political instability jeopardized the continuity of project.

Stability Indicators alert management to changes in the state of the organization. There is stability in the organization if the indicators fall close to standard value. Fluctuation in the value of the stability indicators points to the organization's being unstable. Thus, Stability Indicators increase management's awareness of the state of the organization and, consequently, management's ability to control it.

### **III. THE METHODOLOGY**

The techniques of systems, cybernetics and strategic planning offer ways of improving, understanding and learning about the reality of organizations. The systems approach gives an overview of the organization as a whole and identifies the different systems, sub-systems and processes present in the organization. Cybernetics increases the capacity to interpret and analyze extremely complex situations. Strategic planning offers ways of designing or generating strategies as well as ways of analyzing and evaluating them.

The techniques of all three fields were used in the design of a methodology for the identification and measurement of Stability Indicators.

The methodology used to identify and measure Stability Indicators in Carbocol study is shown in Fig 1. According to the figure, in order to attain an efficient Indicator System, it is necessary to: (A) look for the origin of problems in planning and control in the organization; (B) create the best organizational conditions for the methodology to be operating all of the time; (C) structure correctly the organization under study; (D) identify and handle Stability Indicators; (E) measure indicators; and (F) handle efficiently the implementation process.

As shown in Fig 1, there is interaction between the different stages of the methodology. The explanation here of each of the stages of the methodology is based upon the Carbocol study:

*A. Looking for the origin of problems in planning and control.* The intention in this stage was to perform a diagnosis of the possible causes of problems in Carbocol planning and control. Some of the difficulties that were detected included: a lack of commitment to strategic planning, poor integration of the planning and control function, weakness in plan structuring, weakness in the planning process, weakness in measuring the plan, lack of internal and external coordination and participation, and poor communication in Carbocol.

*B. Creating conditions for effectively solving the problem of planning and control in Carbocol.* In conducting the Carbocol study it was realized that employees' opinions are very helpful to the evaluation of the organization. Further, it may be said that a successful indicator system is viable only with the cooperation of executives involved and their understanding of the organization through their participation in observations, interviews and continuous debates comparing the "real world" and the "abstract model".

*C. Structuring the organization under study.* The most appropriate stability indicators should be easily identifiable after having structured the organization. Then, it is important to find the best structure for the organization in order for it to cover the basic activities that should be measured. This step is grouped in three principal phases: organizational modelling, operational modelling and strategic planning.

Organizational modelling, according to Fig.2, defines Carbocol's recursion structure. It segregated the organization into strategic business units (SBU). For each SBU, a viable system model was defined according to each level of recursion.

Operational modelling should be the output of rationalizing different organizational processes according to "what should be done" at each level of recursion. These processes are shown in Fig.3. Carbocol received the coal, on trucks, in the mine, and then had to take care of the land transport to the railway. A second operator was in charge of the land transport and a third operator handled the coal in port until it was shipped.

The Strategic Plan defines and discusses Carbocol's Strategic Planning. The focus was firstly centred on an external and then an internal analysis of the organization as a complete entity; in this way, it guarantees that the decisions to be taken at each level are appropriate to its level of recursion.

*D. Identify and handle Stability Indicators.* In the process of definition, the important thing is to select the essential indicators that result in the optimization of the cost/ benefit ratio. A constant evaluation of Indicators enables the identification of critical areas, activities or operations. In the Carbocol study Indicators were classified, according to their degree of importance, in terms of efficiency, efficacy, and effectiveness. Importance may be based on the cost to the organization which might be incurred were the indicator left out of the analysis.

*E. Measure Stability Indicators.* For measuring purposes, the indicator is considered as a reason or quotient, to which events or numbers, depending on a set of pre-established rules, are assigned. Managers may effect producing processes, either by increasing or reducing the input resources, varying the efficiency of the transformation process, or varying the efficacy of results according to what is expected from the organization. The criteria of measurement are defined in terms of indices of productivity, latency, and performance as the reason for measuring actuality, capability, and potentiality. A sophisticated performance measure derives from a careful analysis of indicators, beginning with the whole organizational system and segregating each level until it has thoroughly measured the performance of all lower levels.

*F. Handle efficiently the implementation process.* Once Stability Indicators have been established and measured, the implementation of the Stability Indicator System should be guaranteed. This system must, essentially, allow the identification, measuring and handling of Stability Indicators to be adjusted and actualized. The importance of continuously generating debates among managers, plus a systematized information system, may contribute to the use of the indicator system.

The permanent feedback from each of these steps must be a continuous learning process for the managers, whose information, coming from the behaviour of each indicator, could lead either to organizational adjustments, or to re-defining the indicator, the measuring patterns and the patterns of behaviour. An alternative is, simply, to adjust the methodology.

In Fig.4, the absolute value of indices provides not only a measurement of the evolution of each indicator in time, but also helps executives to adjust to the organizational complexity in accordance with the inherent dynamics; thus, it becomes a powerful tool in decision making. The complete Stability Indicators System makes up an Information System which has the main objective of providing the organization only with the necessary reliable and timely information, in the best place,

at the best moment, with the right quality and cost, to develop organizational activities. This information system will support fulfilment, follow up, and monitoring of objectives and strategies for the organizational mission to be duly attained.

#### **IV. CONCLUSIONS**

The methodology makes it feasible to improve the organizational performance and to include corrective actions. Based on the indicators' behaviour, it would be possible to decide on the best action for improving Carbocol's performance. The Stability Indicators System has a monitoring mechanism to be used as permanent feedback which should serve to improve the obtained results of every managerial situation. Thus, it is also indispensable that, from the policies of mine operators, commercial or any other kind of contract, Carbocol could obtain all the information needed to feed the Indicator System.

The Stability Indicator System should improve management's understanding of the organization's behaviour, because it offers them the opportunity to develop a faster adapting and learning capacity. The system enables management to evaluate, follow up, restate and forecast the best strategies to facilitate the feedback process of the Strategic Plan in the organization.

The methodology brings a system that is used to support every decision. It also helps managers to be prepared for organizational deficiencies even before they take place. In implementation it is important to have the institutional support (human, financial, and technical resources) necessary for the normal development of its operation. The success in implementing the methodology depends on a successful combination of organizational culture with changes in the structure systems and people. The existing political atmosphere, in the organization, may deeply affect the implementation of the methodology.

#### **V. RECOMMENDATIONS**

The analysis of Stability Indicators must not be a cold calculation or an interpretation of figures isolated from reality. On the contrary, it should encompass information about the environment in which the enterprise operates. The mechanical usage of indicators can lead to a series of wrong practices. However, sometimes it may seem to be more important to obtain mathematical accuracy rather than to choose the indicators that provide the most valid information.

It is almost impossible to have guidelines that enable the simplification of reality without detrimental effects on the accuracy and knowledge of the variables relevant to identified indicators. It is difficult to find which criteria serve to define the correct indicator. For example, to define indicators which categorize and compare organizations, sometimes it is necessary to use arbitrary criteria that, when applied as standards for the sector where the enterprises operate, would favour the image of certain organizations and harm others.

It is very difficult to define and measure quantifying indicators of every kind of organizations and situations, in particular in the public sector where organization evaluation is not concerned with quantitative indicators; for example, the evaluation of improvements in social and economic conditions affecting miners working for Carbocol. Also, there are problems associated with measuring intangible indicators, e.g., communication, technology, know-how, managerial action, loyalty, etc. It is difficult to identify and measure intangible indicators as by definition they cannot be

expressed quantitatively. For example, it is difficult to identify significant behavioural measurements for managers, since their job generates no end products, either tangible or calculable.

It is important to recognize the need for other methodologies and tools to be applied in the public sector. Resultants from combining the systems approach, cybernetics and strategic planning need to be correlated. There should be emphasis on the complementarism and integration of systemic, cybernetic, and strategic planning approaches for improving the methodology for identification of Stability Indicators and developing a set of their measurements.

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