

# Organization Performance Evaluation Using System Thinking: A Study in Brazilian Chemical Organizations Models

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**Abstract** System thinking allows companies to use subjective constructs indicators like recursiveness, cause-effect relationships and autonomy to performance evaluation. Thus, the question that motivates this paper is: Are Brazilian companies searching new performance measurement and evaluation models based on system thinking? The study investigates models looking for system thinking roots in their framework. It was both exploratory and descriptive based on a multiple four case studies strategy in chemical sector. The findings showed organizational models have some characteristics that can be related to system thinking as system control and communication. Complexity and autonomy are deficiently formalized by the companies. All data suggest, inside its context, that system thinking seems to be adequate to organizational performance evaluation but remains distant from the management proceedings.

**Keywords** Performance evaluation · System thinking · Chemical sector · Organization performance

## Introduction

System Theory and Cybernetics were created in order to help humans to attain a higher degree of holism in an era of unavoidable specialization (Potocan and Mulej 2006). While special systems theory explains a particular system, General Systems Theory (GST) explains the systemness itself, regardless of class or level (Skyttner 1996). The system thinking has contributed to all science areas and when it comes to business management it can improve managers' eyes to have a holistic approach of an organization and its relation with the environment.

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By its very nature, GST is inherently qualitative and descriptive. Consequently, it is rather difficult to be parameterized and to be used in measurements and predictions. Its advantage, however, is that it can address problems beyond conventional reductionist boundaries. On its highly abstract and general level it can, with certain elegance, show comparative similarities between different systems and hierarchical levels (Skyttner 1996). In a practical sense, it can lead to understand how organizations could evaluate and measure their performances using a systemic thinking perspective, instead of taking hierarchical levels as a prerogative.

Financial and Human concepts have shown contribution along academic research in organizations performance but systemic concepts have never into this world. It is crucial that systemic thinking should be considered in this area of business management.

Achieving a certain level of performance in a business constitutes a difficult, but essential activity (Drucker 1964, p. 224). However, due to the dynamics that it entails, evaluating the management of organizations becomes an extremely complex task (Martindell 1950, p. 267). Kaplan and Norton (1987, p. 21) reinforce the importance and inherent difficulty involved in measuring and assessing the performance of an organization, saying that “measuring is important: what is not measured is not managed.” Salterio and Webb (2003, p. 41) go further, by stating that “what is measured is managed”, should be replaced by “what is measured and used in evaluations is managed.” Consequently, it is not possible to evaluate, compare or correct the performance of an organization without reports that contain appropriate and significant information regarding this performance (Phatak 1995, p. 227).

The utilization of methods of measuring and evaluating organizational performance are largely spread. Salterio and Webb (2003, p. 39) state that roughly 50% of the listed companies in *Fortune* magazine’s thousand largest companies use some sort of performance measuring methodology. Meanwhile Silk (after Debusk et al. 2003, p. 217), refers to a survey carried out by Renaissance Worldwide, Inc., which estimated that, in 1998, 60% of the companies included in the *Fortune* list either used or were intending to use the Balanced Scorecard, currently one of the most widely disseminated methods in the world of performance evaluation. Corroborating this perception, according to a study carried out by the consulting firm KPMG, with 143 high-level executives from both public and private sector, 93% of them believe that measuring performance is effective in influencing the performance of their organizations, but a mere 51% are satisfied with their current performance evaluation systems (Drickhamer 2002, p. 14). However, according to Olson and Slater (2002, p. 12), despite their wide-ranging diffusion, little has been researched regarding the usefulness and effectiveness on how companies measure and evaluate organizational performance. And even a more complicated issue is to identify if performance measurement and evaluation methods are robust enough to understand all complexity of organizations in terms of their relation with environment and their intention to survive in long term.

Buchele (1971, p. 143) previously stated that because of the business complexity a simple mechanical analysis to organizational performance is not suitable, which explains the obstacles to find a satisfactory performance measurement and evaluation method; whereas Corrêa (1986, p. 33) points out that most of the studies on the evaluation of the performance of companies “concentrate on a few topics or areas, with no concern for the organization as a whole.” Another relevant aspect is that organization performance measurement is an activity that will always give rise to some subjectiveness, and it otherwise depends on the managers’ skills to the extent assumptions based on intuition (Nørreklit 2000, p. 86). Therefore, the ensuing difficulty is to define a performance measuring and

evaluation system that takes into account all the different aspects and variables an organization has within.

The systemic thinking and the concepts of cybernetics are well known from the works of Checkland (1981) and Bertalanffy (1975) among others, and they constitute a theoretical archetype for understanding companies in their organic sense, analyzing the organization from a broader point of view. It would be impossible to systematically evaluate an organization without first analyzing it in all its content and relationships that it establishes within itself and with the external environment.

Therefore, since it is a very important question, understanding organization performance as a whole becomes an significant element from the management's opinion, despite the business leaders' difficulty in applying such a holistic view (Kaplan and Norton 2004, p. 5). The complexity of this knowledge has not yet been revealed by academic studies, but companies have instinctively begun to work on their operations along these ideas, as soon as their managers realize that it is necessary to incorporate contexts and problems that affect the organization's results.

Despite that we make an intriguing question: does Brazilian companies have already use systems concepts in performance evaluations models?

This paper's aim is track systemic thinking concepts or variables in companies' measurement and evaluation models. Based on a review of the literature and on a research carried out through case studies with renowned companies in Brazilian chemical sector.

## Theoretical Framework

System thinking is based on the idea of understanding the whole. Actually, etymology says the Greek *systema* means the Universe. This sense is constructed by biologic view of the organic system which intends to considerate any organism as a part that interrelates with each other and its environment. Its use, nowadays, is propagated in many areas of knowledge, and is getting strong with companies that care about ecology and sustainability programs.

One important aspect of system thinking is the approach to cybernetics. Schwaninger (2004) argued that cybernetics can be seen as a range of concepts that includes: autonomy (self-governance); complexity (system's potential of assume a large number of states); recursiveness (system/subsystem feed-back); control and communication. Cezarino and Beltran (2009) postulates that system thinking is intuitive and make sense to analyze the organization process, but when we go to management reality all these concepts are hard to find. System philosophy can open minds and eyes but it is hard to make it work in the organizational daily routine.

At other side business performance continues to be a research key point in the pursue of a wide range of methods that aim at rendering performance operational (Venkatraman and Ramanujan 1986, p. 813). Thus, measuring and evaluating performance becomes an essential element for the process of managerial control in any type of business (Olson and Slater 2002, p. 11). Furthermore, measures are the starting point for the improvement of the company itself, because they allow the management to know what the real organization's targets are.

Waggoner et al. (1999) identify four categories of forces that are the "makers and drivers of the evolution and the changes produced by organizational performance measurement systems", namely:

- internal influences, i.e., power relations and coalitions of dominant interests;
- external influences, i.e., law and market volatility;
- elements of the process, i.e., forms of implementation and management of the political processes; and
- elements of change, i.e., degrees of support from the higher levels and the risks of gains or losses as a result of the change.

Johnson (apud Kaplan 1990, p. 88) criticized the use of performance evaluation methods that considered only the accounting aspects of the organization, which are of financial, quantitative and internal nature. The author argues that the paradigm should be changed from management based on restrictions (for instance: cost minimization and profit maximization), to one that prioritizes profitability resulting from continuous improvements in the company's processes, improving the organization's quality and adaptability.

If a comparison could be made, continuous improvement and adaptability are some of the most important system thinking concepts because it means that any system should make valuable exchange to survive in a certain environment. More information an organization can retain to survive the more sophisticated seems the performance measurement and evaluation model. That idea is aligned to Viable System Management (VSM), whenever a system pursues its viability to adapt to the environment, it needs to develop these adaptations and to conform to the restrictions that are imposed to it.

The complexity of the current world drives companies to become introspective with a systemic focus (Bertalanffy 1981). For Morgan and Strong (2003, p. 166) there were many reasons for a shift in performance evaluation towards a multidimensional focus. Firstly, high profit margins market-based performance has turned to be an important indicator of future growth, this therefore describes an increasing focus to variables that are outside the organization, such as sales. Second, the use of multi-faceted methods allows to detect the organizations' wider range of information among analysts and investors. Finally, the rising role of consumers and the innovations introduced by the organizations in order to fulfill their needs on a wider range of interests and stakeholders.

## Methodology Proceedings

Regarding to methodological aspects, this research is both exploratory and descriptive and was based on a multiple case studies strategy in Brazilian chemical companies. It also includes a review of the literature on the subject, in order to provide an overview of the main aspects on system thinking and performance evaluation. The chemical sector is one of highest economic importance in the country (having posted substantial and rising figures over the last few years and accounting for a growing share of Brazil's total GDP, reaching 5% in 2009), ranking 9th among all countries' chemical sectors (ABIQUIM 2010).

The non probabilistic sampling was intentional (Cooper and Schindler 2003, p. 167), and as recommended by Yin (2001, p. 176–177), all of them have their name preserved in anonymous. Yin (2001, p. 176–177) points out that the option of anonymity, when the subject is controversial or regarding the release of the results. All the four companies are not identified here, following a previous agreement for this research.

Data collect was undertaken by two sequence steps: (1) secondary data: documental analysis, sector annual publications, traditional and online media sources including companies' websites; (2) primary data: interview with the strategic planning team or leader and

also semi-structured formulary that could able data triangulation as recommended (Yin 2001, p. 121).

As for the companies' characteristics, all have head offices in Sao Paulo, Brazil, although there are several plants elsewhere along the country. The origin of the company's capital also varies: domestic companies (two of them), one foreign company and one mixed capital company. Likewise, the analyzed companies' size, which correlates strongly with revenue levels, varies widely, a key feature being that the companies make strong use of technology in their production processes.

The analysis of the cases focused on looking for system thinking in our own narrative. We have analyzed each case and then translated to the text embedding systemic look, or in other words, if and how the organization measurement and evaluation models used by these companies are made based on systemic thinking premises. The essential variables were selected from the performance management and system theory framework and presented in the next section.

#### Company "A"

The performance measurement and evaluation model that company "A" uses was created in 1996 and it was a part of major change within the organization. The system combines the *Management Cockpit* and also the *Balanced Scorecard*, resulting in a Strategic Planning and Operating Management tool called *Spring*, which has been running fully since 2000.

The entire conception of the model and of the relevant factors and indicators that make up this *Spring* system were defined by the Executive Board, and supported by a operational team. Indicators started being defined in 1998 after the company underwent a major crisis which was the start to a major change in the company's mentality, according to the respondent.

The model is concentrated in four "walls"; three operational and one strategic whose specific group of indicators is represented by a color, as follows:

- Black: financial focus—shareholder interests;
- Blue: internal resources focus—concerns the quality of the organizational processes;
- Red: external environment focus—concerns the various stakeholders; and
- White: strategic "wall"—reflects the organization's strategic actions.

All the indicators are updated monthly which results in a dynamic and up-to-date panel of the organization's internal and external reality. The indicators are revised annually, as part of the strategic planning process. All the measurements are split across the several hierarchical levels, resulting in a cascade effect, in order to provide integration among them. The total 108 indicators are verified and discussed 23 days before the monthly meetings.

According to the respondent, the results obtained justify and encourage the use of this model: the focus of the discussions becomes clearer; reactions to change are faster; and management committee meetings are more effective, producing a positive external evaluation—which has become a benchmark for the company as a whole. Overall, the quality of decision making had improved.

The model indicators are most of them financial such as cash generation, EBITDA, EBITDA/turnover, ROI, cash flow, contribution margin and others. The non-financial indicators highlighted by the respondent were: internal earnings (control of losses), Overall Equipment Efficiency (OEE), production costs, fixed costs, employee satisfaction,

environmental occupational health and safety ratios, customer complaints ratios, company's image and general information about competitors and suppliers.

The model provides both a short-term focus, with indicators updated on a monthly basis, including a simplified survey of organizational climate carried out on a daily basis or even on-line, and as a long-term focus, identifying five-year trends, checked yearly as a part of the review process.

According to the respondent, it has been possible to establish causal relationships among the variables that influence the company, based on these indicators. To do this, a "wall to wall" examination is being conducted. However, he admits it can be difficult to check joint effects, when many variables are simultaneously involved; for instance, a cost increase might lead to a price increase, but might not result in loss of market share thanks to other external variables, such as a sale increase seasonality.

The respondent highlights that one of the possible disadvantages of the performance evaluation model is that it can keep people away from being more creative and imaginative, since the variables that the model works with are predetermined. Additionally, there is a fatalistic posture risk of accepting results without thinking about the reasons underlying them. There is also a concern to accept that the model is complete and perfect, and that the company may face a lack of a critical posture in order to understand the complexity of the entire process, or a lack of reflection. If the information is widely available, it might produce very valuable complementary views for a broader understanding. The respondent stresses that the panel cannot be static and that it constantly requires complementary information.

#### Company "B"

Company "B" has its own performance evaluation model. Known as Action Plan (PA), it began back in the 1960s created by the holding enterprise group that later had acquired Company "B". Thus, since company "B" was first set up in 2002, it has used PA as the base of its strategic planning as well as of its performance evaluation model. Because of PA's importance, it also plays a key role in the organizational culture and also serves as a communication tool throughout organization's levels.

Each employee in the organization has an individual PA. Thus, there is a bottom-up effect, in that both the negotiation of individual targets and the remuneration that is compatible with those targets are taken into account providing the strategic alignment of everyone in the company.

Reinforcing its strategic character, the PA setting process takes place on an annual basis. The scenarios for the next 5 years are defined, a detailed one being provided for the first year and less specific ones for the subsequent 4 years. This process is repeated every year, and constitutes the five-year business planning cycle, which provides all the directions in terms of actions to be taken by the company.

The entire process of defining the strategic planning and the action plan takes 6 months. It starts in June and July, with the definition of the forecast scenarios for the following year as well as for the subsequent four; in August a seminar is held with the company's various managers when these scenarios are presented and confirmed; between September and November the budget for the period is drawn up; in December the plan is presented to the committees and then the reviewed plan is communicated on to the entire organization.

Besides the PA, other management tools and concepts are also used. The respondent stressed the importance of a Managerial Information Model that provides support for the design and monitoring of the PA process. Financial budget simulation systems are also

used, reinforcing the quantitative and exact nature of the process, as well as a specific model for determining scenarios, which allows greater flexibility in setting them. Thus, the model has a synthetic nature, working fast. Moreover, the entire organization takes into account Corporate Governance concepts and best practices, which guide all its actions.

The respondent states that there is a tradeoff between the model precision and the process speed. The more detailed it can be, the longer the process takes. This is a dilemma that the management must resolve. He says that the model results in a dynamic balance within the organization. In his words, a “living organism” which provides an interrelation and inter-dependence between all of the organization’s levels.

As far as the respondent is concerned, the cultural element is essential to the success of the model, because the PA concept is internalized by each member of the company—as stated before, this tool is older than the own Company “B”. This model stimulates the participation and commitment of everyone in the organization, in addition to the aforementioned strategic alignment at all organizational levels. Discussion and debate are implicit to the process, though it can cause attrition between areas and people with interest conflicts. The respondent also emphasizes that recently the company tried to implement Balanced Scorecard (BSC) concepts but it failed because a certain incompatibility between the BSC and the PA culture which is predominant in the organization.

As for the employees, there has been a practices alignment with business strategies and a very strong commitment to the plan’s predetermined result. Each individual becomes responsible for his or her own targets and should have a critical, reflective posture, which stimulates discussion in regard to the establishment of targets and monitoring of actions. According to the respondent, people refer to “my PA”, which gives an indication of everyone’s commitment to the tool and of its importance.

#### Company “C”

Company “C” performance measurement and evaluation model was conducted by a major multinational consulting firm that began in August 2002 and was only concluded in October 2003. Based on a change in the organizational structure that had questioned the processes sequential definition within the company those processes were divided into 13 macro-processes, which in turn were divided into 58 sub processes. The organization’s goal was that at least 70% of the critical processes achieve the so-called “world class level”. Using a process maturity scale from 1 to 5, this means reaching at least 4. That score were created by consensus in a commission comprising members from various areas, which meets every 2 months.

The design of a new performance evaluation model remained the company’s five major functional areas (Marketing, Industrial, Financial, Human Resources and Information Technology) and involves the Executive Board as well as representatives from all the processes, from all the several areas.

As for the indicators used, most are financial, such as Return on Assets (ROA), which is the parameter and guideline for all of the company’s activities and projects. As for non-financial indicators, there is a great variety of them, ranging from customer satisfaction to occupational health. There is also a hierarchy of company indicators: eight strategic indicators (Key Success Factors) of a financial nature, determined by the company’s senior management; and a further 84 operating level indicators, 22 of which are the so-called Key Performance Indicators. Thus, there are a total of 92 indicators. Cause-effect perceptions have been particularly clear in the case of some processes, but have been very hard to obtain in the case of others.

According to the respondent, the advantages of using the performance evaluation model in the organization include ongoing performance tracking, both short-term and long-term; the possibility of customized metrics for each of the company's processes; and the participation of all the areas, which thus become part of the process vision and value chain.

The company needed to retrain the top management regarding the evaluation processes importance and also to improve the understanding of these tools to foster a change in mentality across all of the organizational levels (by the time the company had 85 leaders, including directors, managers and operating department heads). The respondent stressed that the evaluation model is heavily focused upon efficiency, rather than on effectiveness, because there is a clear emphasis on production, which results from the company's industrial origins. Another point is the lack of any comparative analysis with other companies, due to lack of available information.

It was also mentioned as facilitators for the process implementation: the quality of the tool employed—as tailor-made, it could take into account the organization's particular characteristics; the clear definition of those responsible for the indicators; the strong involvement of senior staff in performance; and the existence of a “general control” of the process, which provides a holistic view of everything that occurs within the company. Elements that restrict the success of the process could be the focus on efficiency rather than on effectiveness, as already mentioned, and the lack of any strategic-level monitoring centered on something other than the finance.

#### Company “D”

Company “D” uses several tools simultaneously to evaluate its performance. In 2001, at the instigation of its Executive Board of Management and Control, which is responsible for the design and implementation of the performance evaluation models, two tools were concurrently implemented: EVA (Economic Value Added) and the Balanced Scorecard. The company's objectives in embracing this were: to establish financial performance improvement targets; to clearly express its long-term strategy; to adapt its incentives plan; and to train its personnel in the use of these new tools. The Balanced Scorecard (BSC) is mainly used in order to evaluate and communicate the company's business strategy, whereas Economic Value Added (EVA) is used for financial evaluation purposes and involves factors such as cost management, capital investments and the value added by products and clients. Furthermore, other tools connected with Quality and Safety Management are also used, and it was the company's intention to shortly implement *Six Sigma* in the production area. According to the respondent, taken together, the models employed have proven to be appropriate for managing the business.

Previously, the indicators were mainly financial, with traditional measures such as EBITDA, net profit and ROI being used. Thanks to the new models, however, there has been a switch in emphasis to EVA-related metrics. The company's performance targets started being determined by the company's market value and by expected shareholder return. This process complements the function of the budget process, which focuses more on the operational side.

At quarterly meetings, the Executive Board discusses the main BSC indicators and there is a focus on continuous improvement and constant modifications, in an attempt to increasingly integrate the use of BSC and EVA. Meetings are held every quarter to discuss performance focusing on those strategic issues that are critical for generating value for the company. There is not a predefined time gap for reviewing the model, in view of its emphasis upon ongoing improvement.



According to the respondent, no element was clearly identified as having a restrictive influence on the process, and it is his belief that any lack of alignment with the direction set for the company, which has an impact on the performance evaluation models, would be fatal for overall company performance.

Thanks to those models, the respondent's perception is that company "D" has now achieved greater clarity in its strategic direction and can tie its activities into this strategy, with a clear focus on value generation. Other benefits include a stronger focus on key issues, more efficient communication of the strategy to the entire organization, with a constant review of the organization's directions, and an in-depth understanding of what did not occur as planned. In addition, the respondent believes that there has been a change in the level of the organization performance since the new management models were implemented.

### Overall Results

This section analyzes and compares the main points described, and to provide a general picture of the characteristics of the performance evaluation models of the companies studied and their system thinking characteristics.

The organizational performance evaluation models used in the companies had different origins and design processes. All the companies, except for "B", resorted to different consulting firms to formulate their models. In all cases examined, the models have only been implemented recently. But it is important to focus the Company "B" model was a legacy from its ex-holding company, which therefore had already been tested.

All the performance evaluation models showed, and continue to show, intense participation of senior management, reinforcing the importance of the issue of performance metrics and evaluation among the companies researched.

As has already been pointed out, despite the recent introduction of these models, the companies are interested in periodic reviews, the highlight here being company "D", which has a policy of continuous change, without no predetermined time interval for reviewing the model. Company "A" presents reflection lacks worry in their employee following the model indicators without questioning or neither creating new ideas.

In general, all of the models studied included:

- both financial and non-financial indicators;
- both short-term and long-term perspectives;
- indicators created by those responsible for the process.

Some systemic reflections can be made according to case studies information. First the performance evaluation models are far away from been designed in a systemic philosophy. There are customized to communicate business strategy, align operation actions and improve financial and in some case human indicators. None of them have shown survive indicators or market and environment monitoring technical process. They all present business management control to "inside" company neglecting any kind of systemic thinking.

It can be pointed out that all companies have a predominantly quantitative focus, and prioritize financial aspects, confirming what had already been identified in the literature review. An interesting point was the discussion with the interested parties about the identification of the causal relationships through the indicators. It seems that this is an issue that still needs to be improved in the models, particularly regarding those variables that are external to the organization, the complex processes that involve the value chain, and the

combined effects caused by several variables independently. This fact shows that all companies have some kind of effort to approach recursiveness but they have not got to optimal models for that yet. They feel and recognize the recursiveness of organizational system but they cannot formalize practical metrics to reach such variety.

The following elements were mentioned as facilitating the implementation and operation of the performance evaluation models: the existence of an integrated information system; the adoption of an empowerment philosophy, which generates a greater degree of commitment on the part of those people involved in the measurement and evaluation processes; the quality of the management information systems which provide support for the performance measurement and evaluation models; the existence of parallel budget and scenario establishment models, with complementary actions; the presence of an organizational culture that stresses the focus on performance and its monitoring; the clear definition of responsibility for the indicators; senior management's participation in the process; the possibility of a general, broad control of the process, rather than a focused, departmentalized one; and the carrying out of benchmarking and of constant investments directed towards the continuous improvement of the measurement and evaluation processes and models.

All these information leads to the discussion about what autonomy organization really need. Companies' status reflect that when self-regulate all system flow of information becomes easier. Other point that can be stressed here is that communication is really enforced by organization's information systems and all complementary practices go in the same way.

In a similar approach, the following elements were cited as having a restrictive influence: the difficulty of obtaining information in relation to the external environment; the difficulty of integrating the various existing information systems; the need for senior management to undergo recycling in order to develop on them a mentality focused on performance measurement and evaluation along with the resulting change in mentality of everyone in the organization; and the need for users training as well as of those who are responsible for the models and information.

This late observation represents the complexity concept of system thinking analysis. All models show in some degree lack of capacity in change and in flexibility. Two of them show short term focus which goes against the understanding of a systemic viable model. They appear unable to deal with total organizational change including its environment. That becomes even more emphatic because external environment data is not noticed and all of them base their models only in quantitative data which clearly is not possible to broad environment complexity of them. This description illustrate that models are static and simplistic in terms of autonomy, recursiveness and cause-effect relationships.

## Final Thoughts and Considerations

This paper has described the main aspects of the measurement and evaluation models of four large companies in Brazil's chemical sector. The analysis was based on system thinking concepts and the findings contribute to offer suggestions to increase the effectiveness of these sorts of models in organizations in general.

It is observed that the structure of performance evaluations model are very concentrated and only covers limited complexity. The crucial factors are the restrictive elements that were pointed out by the companies in the study, such as retraining needs, change in mentality and the predominance of quantitative and financial indicators. There are

evidences in this paper suggesting that if the performance evaluation model is progressing, essentially, toward the construction of a more global one, it will include aspects of the company's internal relationships as well as its inter-relationships with the environment. In general, companies still have a model that centers on ensuring strategic objectives. However, a new context, both internal and external, addresses ambiguous aspects that remain in the background. The idea of a viable system is not entirely present and despite system concepts as communication and control to be representative in these measurement and evaluation models, the lack of recursiveness, cause-effect relations and autonomy reflects in their restrictions.

However, performance evaluation models are created to organizations to ensure their survival, but thinking in systems they should include global aspects and elements like organization's relationship with the external environment. Studying the complexity of these relationships to subsequently evaluate them is, undoubtedly, an essential element for the progress of organizational practices not only in Brazil, but worldwide. Another model improvement it would be the qualitative indicators like: dependency-autonomy departments levels, performance indicators cause-effect and performance (negative or positive) relation within organization, in departments and areas.

However, according to the relevance and growing importance of this theme for organizations, we hope that the objectives of this paper have been achieved. Future research may foster the debate on how to measure and evaluate the performance of an organization in ever more systemic way.

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