CO-CREATING A SELF-ORGANIZING MANAGEMENT SYSTEM: A BRAZILIAN EXPERIENCE

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INTRODUCTION

Our intention in writing this paper is to share the experience of creating a managerial system based on the principles of complexity. In 1997, the intellectual curiosity about the organizational possibilities of the Complexity Theory brought together university and industry – represented by these authors – in the effort to develop an alternative that could make organizations more creative and, thus, adaptive.

At that moment, in Brazil, complexity was emerging as a research subject for production engineering and business administration, and some doctoral researchers began to choose it as a theoretical basis. Although such theory promises to offer a path for more adaptive organizations, the idea of self-organization can be uncomfortable for managers, as it can be associated with lack of control. This feeling brings major difficulties for researchers who aim at practical studies, especially via action-research methodologies.

Fortunately, the possibilities of complexity theory seemed to fit perfectly to the needs of a senior executive of a Brazilian beverage company – one of this paper's authors. He was supposed to develop a new managerial system to be implemented in a new plant of his responsibility. Therefore, we engaged in an action-research project to co-create a self-organizing management approach. The project delivered two products, which correspond to academic interest and practical business demand. Respectively, they are:

1. A conceptual framework to help understand organization through complexity.
2. A business-specific framework – entitled *'Autonomous Management System'*.

CONCEPTUAL FRAMEWORK

According to this conceptual framework, a business organization is a complex system made of several individuals that pursue their own ends. These individuals are mutually dependent and subject to contextual forces that influence interaction patterns. As so, they are continually adapting to each other and to environment. Even in classical bureaucratic organizations, self-organization can be observed, given that a great deal of decision and action occurs in the context of 'informal organization'. The real organization emerges from complex interactions between numerous individuals that, although oriented by rules, are able to learn from experience and continually adjust their behaviour and their strategies.

We suggest that organizational creativity and adaptability can be intensely enabled by promoting autonomy. The order exhibited by complex adaptive systems is due to a process of self-organization, by which autonomous agents are allowed to act according to their own judgment capacity. Therefore, complex social systems can also benefit from structures that permit freedom for every individual to consider rules and constraints and, then, to choose among diverse possibilities of action.

Our analysis identifies four key properties of complex systems that resume the process of increasing complexity: *autonomy, cooperation, aggregation and self-organization*. They are interlocking concepts that indicate how the system order can emerge from the actions of its parts. A summary of how these concepts relate to each other can be stated as following:

> ***Autonomous individuals*** *- capable of learning and adapting -* ***cooperate*** *with each other and obtain adaptive advantages. Such behaviour tends to be selected and reproduced, until the point in which these cooperative individuals stick together forming an* ***aggregate****. From then on, the aggregate itself behaves as an individual on a higher level of complexity. Continually, this phenomenon goes on: aggregates combine forming new and more complex aggregates. The resulting system* ***self-organizes****. A global behaviour emerges, whose performance is evaluated by the pressures of selection coming from the environment.*

Providing a business organization is understood along with this framework, structure and leadership gain new forms and meanings. For aggregate creativity and innovation to emerge out of distributed learning, it is important to promote an interconnected structure, in which leaders become a central element for intensifying communication.

A continuous process of variety generation and selection takes a system to higher levels of complexity and adaptability. Likewise, individuals' autonomy and competent leaders' orientation can make an organization more creative. Since more people contribute for the generation and recombination of ideas, there is more chance for successful innovation. Leaders, on the other hand, should manage the selection process. Although, in most situations, selection is an externality (market forces and social pressure, for instance), leaders can be extremely important if they are competent in acting on the boundaries. That means they should facilitate and mediate communication between individuals and external environment, making the autonomous individuals aware of the selection pressures.

'AUTONOMOUS MANAGEMENT SYSTEM': A Brazilian Experience

For more than a decade, after a profound re-organization process, a Brazilian beverage company has been investing in managerial tools and expertise in order to improve performance. This company occupies the fifth position in the beverage international market, and is a 'world class company'. By the end of 1997, with almost 20 plants, the company decided to build two new plants, using the most sophisticated technology available in the world – one in the northeast and other in the south of Brazil. Each setting-up project was assigned to a senior executive who, besides constructing the plant, was supposed to implement a new management system. They worked in parallel, independently. The south plant was the scenario for this action-research project.

The project team was influenced by experiences on self-managed teams observed during visits to other 'world class' companies in the country and abroad, and also by the theoretical support of the academic researcher, who introduced the complex adaptive

systems issue. Hence, the team chose to create a management system whose fundamental aspect was autonomy. The '*Autonomous Management System*' (AMS) was designed to support teamwork and open communication, incorporating principles of network in the formal structure. Believing that agility and innovativeness emerge from an ample diversity of skills and talents, leadership should provide just enough conditions to enable ideas and decisions to flow and to propagate.

One important feature of AMS is the '*Star System'*, in which production activities are conducted by autonomous teams – 'stars' – whose members also represent support areas, such as human resources, maintenance, environment, quality assurance, finance and logistics. Each member of a production team is a specialist in one of these subjects, even though they are not part of the administrative staff. These individuals are called 'Star Points'. We can say that the structure of this plant is a network formed by many 'stars', linked to each other through 'star points'.

In order to assure the durability of the ties created, the 'star points' of each support area participate in monthly meetings, in which they can discuss relevant issues with other similar 'star points' and members of staff of their support area. Besides allowing close contact among individuals that work in three different shifts, this structure helps the production teams to focus on quality and to reduce costs. Moreover, this networked structure permits that support areas, like human resources or finance, for example, have fewer people and more velocity in the interaction with the production area.

Network structure, teamwork, high levels of autonomy, deep technical knowledge and administrative expertise are essential characteristics that set the conditions for AMS to work. Yet, what makes it unique is the set of features (indicated in figure 1) that forms a 'minimum structure' for guiding individuals' action. These features are in line with the conceptual framework presented before.

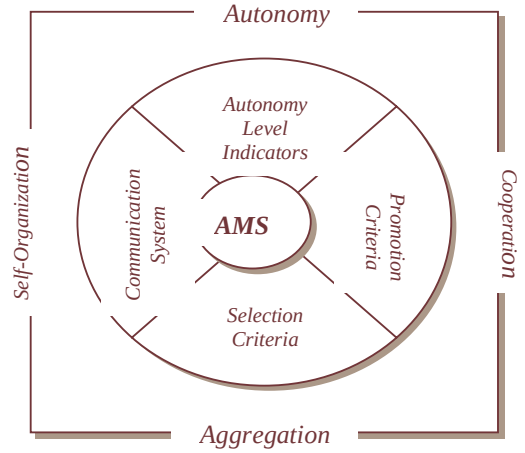

Figure 1. The conceptual framework in practice.

Autonomy Level Indicators allow individuals to track their level of autonomy. In addition, since this database is accessible to everyone in the plant, the search for autonomy is reinforced. Likewise, cooperation is promoted by clear and precise *Promotion Criteria*, which help individuals understand the rules they must follow in order to get the expected rewards. *Selection Criteria* increases the team's ability to make selective interactions and,

therefore, to attract, to hire and to maintain those individuals who contribute to the performance of the aggregate. Finally, *Communication System* provides a mechanism of feedback, what is essential for learning and self-organization.

'AMS' ASSESSMENT

Among the 20 company's plants in operation in the two years that followed its start-up, the new south plant showed the most remarkable scores. During the first two years of operation, the plant was considered, for 10 times out of 24, the '*standard beer*' of the company (title received by the plant that produces the best quality beer of the month). In the same period, its 'returnable' packaging lines (there were 10 other plants with similar lines) achieved the highest productivity scores of the holding company. Although difficult to assess, the friendly climate was a signal of the superior quality of life and of relationships present in the workplace of the south plant. Regardless of the higher responsibility individuals had to assume, most of them declared to enjoy autonomy. From both the perspectives of efficiency and of individuals' satisfaction, AMS was a very successful experience.

However, its success was a reason for its future failure. Three years later, all the managers and supervisors had been promoted to higher positions in other plants. Despite the technological sophistication and the quality of its personnel – highly educated people, from the best universities and technical schools in the country – the south plant was not able to sustain the same performance pattern as before. Moreover, those outstanding professionals who created AMS did not have the chance to reproduce it in other plants, as they were isolated from each other. Once those people left, AMS was lost. Today, the south plant is one like the others. It is efficiently managed as all the other plants of the company are. Likewise, its performance became similar to the average of the company.

CONCLUSIVE REMARKS

The experience here described is just one example of the infinite possibilities of application of the complexity perspective to management. It demonstrates, through tangible data, that self-organizing management can produce superior performance in comparison to conventional administration. However, AMS also shows that excellence is not enough to guarantee long-term adaptability. The resulting organizational performance does not make a management system robust. So much so that, despite the exceptional performance it permitted, AMS died without leaving any heirs. As an emergent phenomenon, this management system vanished as soon as the key components were removed. As a cultural product, a management system (self-organizing or autocratic) exists as long as people nurture it, collectively.

BIBLIOGRAPHY

AGOSTINHO, M. (2001) *A Organização Emergente: Gerenciando o Processo de Auto-Organização*, Tese de D.Sc., Dep. Engenharia de Produção, COPPE/Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro.

AGOSTINHO, M. (2003) *Complexidade e Organizações: em busca da Gestão Autônoma*, São Paulo: Editora Atlas.

AXELROD, R. (1990) *The Evolution of Cooperation*, London: Penguin Books.

GELL-MANN, M. (1994) *The Quark and the Jaguar: adventures in the Simple and the Complex*, New York: W. H. Freeman and Company.

HERBST, D. (1993) "Designing with Minimal Critical Specifications". In: *The Social Engagement of Social Science: A Tavistock Anthology, vol. II: The Socio-Technical Perspective*, Philadelphia: University of Pennsylvania Press, pp. 294-302.

HOLLAND, J. (1996) *The Hidden Order: how adaptation builds complexity*, s.l.: Helix Books.

KELLY, S. ALLISON, M. (1999) *The Complexity Advantage*, New York: McGraw-Hill.

McMASTER, M. D. (1996) *The Intelligence Advantage: Organizing for Complexity*, Boston: Butterworth-Heinemann.

SCHONBERGER, R. J. (1986) *World Class Manufacturing: Lessons of Simplicity Applied*, New York: The Free Press.

SIMON, H. (1976) *Administrative Behaviour*, New York: The Free Press.

TRIST, E. (1981) *The Evolution of Socio-Technical Systems*, occasional paper n. 2, Toronto: Ontario Quality of Working Life Centre.

von BERTALANFFY, L. (1950) "The theory of open systems in physics and biology". In: EMERY, F. (1969) *Systems Thinking*, Middlesex: Penguin Books.

WALDROP, M. M. (1994) *Complexity: the Emerging Science at the Edge of Order and Chaos*, London: Penguin Books.