EPISTEMOLOGY OF COMPLEXITY IN A STATE OF CRISIS. LEADERSHIP AND COORDINATION AS CATALYSTS OF NEGHENTROPY

Zanda, Stefania; Castaldo, Francesca

Department of Management, Sapienza University of Rome, Italy

ABSTRACT

This contribution is intended as a reflection on the soul of the corporate system and its ability to respond dynamically to maintain conditions of vitality and prosperity in the face of ever new and sometimes unforeseen events.

As in any living, dynamic and complex system, the harmonious functioning of the various parts of the system is underpinned by mechanisms of regulation, self-regulation and autopoiesis; the company is therefore considered to be a dissipative system. The regulatory and autopoietic mechanisms are activated by a constant two-way internal-external exchange of energy and matter, capable of stimulating a negentropic evolutionary dimension, even in situations of instability (Prigogine and Nicolis, 1982).

The company that achieves its goals is said to be “effective”; the company that does so at the lowest cost is said to be “efficient”; the company that does both is said to be “economically managed”.

Underlying this discourse is the often taken-for-granted fact that firms must operate under *equilibrium* conditions or else exit the market (in the absence of subsidies from external agents). But companies are not biological systems that are inherently capable of reaching homeostatic states. Too often we forget that it is mainly the 'visible hand' of top managers that influences the state in which a firm finds itself.

The search for equilibrium and its maintenance are hardly self-generating.

The fathers of our disciplines already claimed that “economy expresses the ability of management to maintain economic equilibrium” and “profitability expresses the ability of management to generate positive income” (Caramiello, 1993).

It is the economic actors - the owner-entrepreneurs, in the case of small companies - and the top managers - in the case of large companies - or, more generally, the leaders who make the difference, who lead a business system to operate in conditions of equilibrium (economic, financial and organizational), and who have to restore these conditions when they change in response to events, internal or external to the organization’s boundaries, whether foreseeable or not.

Immersed as they are in *VUCA* (volatile, uncertain, complex, ambiguous) environments, today's companies and the leaders who run them are called upon to rebalance their organization, for example

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to enable it to respond appropriately to a shock by ensuring business continuity (Volpe and Castaldo, 2021).

Thus, each entropic trend tends to be matched by a syntropic (or neg-entropic) one in order to achieve states of 'dynamic equilibrium'. This involves the coordination of the business system and the need to reach situations of interdependence (Grandori, 1995); to find or rediscover the harmony of interpersonal integration relationships, to ensure a compatible relationship between the interests of the various stakeholders and to guarantee operational and managerial policies in line with the company's objectives and mission.

As the *Patres* of Business Administration have affirmed, "the company is not a dissociated mass, it is not a collection, it is not a temporary juxtaposition of unrelated factors or phenomena [...] in its structures it is always renewing and recomposing itself; in the dynamic processes it carries out it is always transforming and openly manifesting itself, as dictated by the changing circumstances to which the company must adapt" (Zappa, 1956).

In other words, it is not enough to design and implement orderly structures, it is necessary to keep them in harmony and ensure their vitality.

Our contribution aims to answer the following research question: "If today's companies operate in extremely dynamic, ambiguous and, to some extent, unpredictable contexts, what characteristics should top management possess and what levers should it use to manage such hyper complexity, to balance entropic and neg-entropic forces and to achieve states of 'dynamic equilibrium' that allow the company to survive and develop?".

This question is particularly relevant when it comes to managing serious crises (wars, pandemics, international economic and financial crises, etc.), which require a radical adaptation of corporate governance to environmental dynamics.

The research methodology is qualitative, based on the identification and analysis of a selected bibliography. The approach is interdisciplinary and covers various fields of study: economics, management, philosophy, business organization.

Inspired by general systems theory, we have endeavored to integrate the various specialist contributions in order to develop a framework on the basis of which the business system can be interpreted as a unitary, integrated reality in continuous evolution. A socio-economic system that is open, complex, probabilistic, ductile, evolving according to the principle of equifinality and endowed with regulatory processes that make it possible to achieve homeostatic situations at increasingly complex levels (Beer, 1969).

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These equilibria are, of course, of a different nature from the static equilibrium of closed systems, in which entropy (disorder and lack of coordination) tends to increase continuously and vital energy (useful in terms of work) decreases progressively (Prigogine and Nicolis, 1982).

In open organizations, the regulatory processes control the functioning and development of the system, with the aim of maintaining a certain degree of stability and order, and of allowing the system itself to undergo processes of development and differentiation, also through the acquisition of new vital energies from outside: the capacity for original vision, organizational skills, specialized and exclusive technical and managerial knowledge, creativity, imagination, and so on. The acquisition of such new energies can also take place within the organization, through a process of autopoiesis triggered by enlightened and intelligent management.

Management and coordination develop the regulatory process by activating 'neg-entropy'/syntropy, which guarantees the evolution of the system towards higher order 'differentiations' (von Bertalanffy, 1968).

What we want to emphasize, however, is that the search for homeostatic equilibrium, differentiated development and the acquisition of *pneuma* (πνεῦμα, in ancient Greek) - to which we will give a specific definition in the context of business activity - are not generated automatically.

It is the quality of management that creates these conditions and determines the success of the system and its ability to cope with internal and external crises, even the most unpredictable and serious ones (Zanda S., 2018).

We also aim to highlight and discuss the nature of the effective and efficient management process and the management interventions that management can rely on to ensure the survival and growth of the business system.

These can be summarized as follows:

A. Restructuring of organizational roles and lines of influence, both authoritarian and non-authoritarian, linking the various members of the corporate system (this is structural coordination).

B. Creating and maintaining an efficient information system that allows decision-making, execution, and control processes to be implemented at the appropriate level; in times of crisis, the information system plays a key role in corporate governance.

C. Redefinition of the decision-making process (definition of objectives and strategic management paths to achieve them); in times of crisis, decisions must be leaner, faster, based on concreteness, uniqueness of action, imagination, and creativity.

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With regard to the application of the principle of equifinality, the quality of the search processes and the management's ability to elaborate and implement a "strategic management of installation", i.e. the renewal of the existing and the construction of the new, are very important (Coda, 2021).

D. Search and selection of personnel suitable for the roles to be filled, training and education according to the specific needs of the organization.

E. Adopting an appropriate management model.

The latter will be based on 1) the ability to operate by creating a congruent entity of "value" for all internal and external stakeholders; 2) respect for the economic-financial balance of management and the continuous development of operational efficiency; 3) management orientation towards the common good, respect for the environment and the growth of the people working in the organization, disseminating several levels, in the strategic, tactical and operational processes, a "distinctive moral practice". A moral practice can be understood as "a practice whose actions or inactions influence others, both now and in the future. It helps shape the moral order of organizations and societies, which, in turn, affects individual and organizational behaviors' (Carnegie *et al*., 2022).

With regard to the last point, our research proposes to analyze whether, in 'VUCA' environments, potentially characterized by unpredictable and severe crises, a leadership style inspired by stakeholder theory (SKT) is the most effective, i.e. one that, based on a 'strategic management approach', tends to overcome the opposition between economics and ethics and to integrate the interests of the various stakeholders.

Keywords: complexity, entropy, organisation, coordination, management, leadership, VUCA context, crisis.

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