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CONTEMPORARY ORGANIZATIONAL REALITY THROUGH THE EYES OF CHAOS THEORY: A LITERATURE REVIEW

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Abstract

Since the beginning of scientific management, organizations have been managed by linear structures and rigid scientific understandings, where and for decades scientific models have been dominating the way organizations are built and the way organizational reality is foreseen. Primarily, these traditional managerial perspectives have been challenged by the Chaos theory, which came to detect the linearity ruling each and every aspect of organizations' course of work. Indeed, this theory was not sufficiently conceptualized in organizations' philosophies and practices; however, within the rapid pace of the continuous changes and instabilities around, the attention to it has been on the rise. Amid the critical importance of linear methodologies and the revolutionary development of Chaos theory, this paper aims to study chaos and the essence of Chaos theory among historical and contemporary perspectives, its contributions to organizations among a bundle of opportunities and constraints, and the extent to which this theory reflects the contemporary organizational reality. Additionally, within the realization of the complex-dynamic features of organizational structures, chaos and order concepts are analyzed along with the convergence and divergence of managerial processes which are debated to be initially embedded in organizations. Furthermore, new managerial perspectives are discussed, giving rise to the challenging necessity in having to persistently manage chaos with flexibility and innovation.

Keywords

Chaos theory, Dynamic systems, Scientific paradigms, Contemporary organizations, Chaos management

1. INTRODUCTION

Ever since the creation of managerial bureaucracies, organizational theories have emerged under the influence of several scientific approaches including Newton's paradigm. However, at the beginning of the 20th century, the chaos science came to change the standards in organizations management, reflecting the dynamic-chaotic nature of organizational systems. Primarily, organizational reality has been pushed into an unknown territory along a set of unprecedented global trends. According to Tetenbaum (1998), critical transformations in manufacturing and services industries, newly emerged technologies, and the increase of interactions across boundaries have all led to major complexities in shaping organizations structures. Undeniably, these emerged complexities have awaken organizations to look deeply on how change is besieging and reforming the future, as their traditional and systematic approaches have to be revised and examined. In this vein, according to Gray (2007), as humans, we do not have the ability to shape the whole system we do live in, so that we try our best to approximate its limits; despite all the social and technological changes around, we do see ourselves as a big part of these complex interactions, trying to create and build a balance between order and instabilities. Certainly, this realization has questioned the maturity of the management literature which is built on the assumption of implicit stability and predicted predictions. Indeed, this literature review sheds the light on how contemporary organizational reality is conceptualized in the era of chaos and dynamism.

In essence, this research work contributes to the body of knowledge in various means. To the author's best knowledge, this literature review is among the first to address the evolutionary role of Chaos theory in association with the current managerial methodologies across organizations. Additionally, it brings researchers and practitioners a clarified view of the existing studies in this area, where it deeply examines and demonstrates organizations' need for an urgent transition towards a new managerial orientation that best matches the current organizational reality.

The remainder of this paper is structured as follows. In the second section, an understanding of chaos and Chaos theory is displayed. In the third section, an overview on the contemporary organizational reality is presented. Besides, in the fourth section, the linkage between Chaos theory and organizations is discussed. In addition, in the fifth section, the managerial processes needed for organizations' survival in the chaotic realm are revealed. Then, in the sixth section, the limitations of Chaos theory are argued, to be then followed by the conclusion in the seventh section.

2. THE UNDERSTANDING OF CHAOS AND CHAOS THEORY

2.1 The Concept and Background of Chaos

Nowadays, the evaluation of social and organizational reality is echoed through different approaches, where regardless their basic assumptions differences, they do approve systems' chaotic nature (Baofu, 2007). In our everyday language, the word "chaos" reflects the missing kind of structure and discipline; it reflects disorder and turbulence. Initially, chaos is conceptualized in "mythology", which reflects the birth of human kind. Although the reasoning of myth is that of unconscious thought, it is as reasonable as philosophy and science (Caldwell, 1993). In Greek mythology, chaos is defined as the embodiment of the primeval void which had existed before order was enacted in the universe (Grimal and Kershaw, 1991). According to Galacgac and Singh (2016), Hesiod's Theogony is another reproduction of this concept, in that initially the void came into being the Earth, the solid and the everlasting home of all, and out of void came the darkness and black night (Brown, 1953). Within this deep ambiguity of earth's creation and darkness' emergence from the void, there exists a reflection of chaos, displaying that no order has existed, or mostly no perceived order has been out there (Caldwell, 1993). Accordingly, chaos cannot only be associated with a lack of order, but it can also be better viewed as a new order emergence, as a formless state of totality prior to perception. Indeed, chaos as the "unknown" has been a complex debatable issue in the scientific world of mathematical equations and patterns, in which some meteorologists, mathematicians, physicists and biologists could not accept that nature is deviating into newly pronounced observations. According to Baranger (2004), chaos has been perceived as a mathematical notion of calculations and facts. However, in its deep perception, chaos is a revolt over calculus, where prediction is not always a function of constantly keeping track of changing variables, and outcomes can still fall into the trap of long-term vagueness. Hence, in its broad conceptualization, chaos would be an assortment of mathematical truths that have nothing to do with calculus, which was particularly revealed in nature's changing patterns and behavior. Mainly, within the debates surrounding the chaos concept, a little stop on the Chaos theory could remove the ambiguity of how different dynamic- chaotic systems work (Manuel, 1990). This is not to say that scientific study of change is considered outdated, but its power would be limited and it is currently a part of the truth, and this is not to say that the connectivity between the duality of the controllable and uncontrollable will be fully conceptualized; however, a wise understanding of chaos and Chaos theory might be the lost needed lens to better envision the contemporary organizational reality.

2.2 The Essence of Chaos Theory

A full realization of Chaos theory reflects a critical observation of the interactions happening inside opposing systems, where dialectical forms of changes are merged together, and the "constant" perceived variables' relationships are brought to the front. Similar to the 1960s systems theories, the Chaos theory initially emerged in natural sciences to find its way later in organizational issues (Kiel and Elliot,1996). The 1960s systems theories directed our thoughtfulness to carefully study the correlation between the effect of the environment on organizations, the need for adaptability, and the significance of organizational interconnectedness towards goals achievement. According to Farazamand (2003), similar to former Greek philosophers, as Plato and Aristotle, many systems theorists including Marx, Engels, and Hegel offered key structural aspects of the inherent chaos in the interrelationship between opposing systems parts, the big influence that larger environment can have on organizations' systems, and the necessity and desire of these systems to get their equilibrium at any cost. In this context, Weinberg (1964) emphasized Sina's perspective in offering a careful view of how accidental chaotic changes can trigger critical bifurcations followed by order and stability. Mainly, regardless Sina's central perspective in the cause-effect relationship between mind and matter, he

emphasized the significance of looking into the possibility of changes occurrences at any time. For Sina, the relationship between man and nature is an evolving- interdependent process in the universe, in which through man trials to modify the environment he is shaped by, he ends up changing himself as being a part of it. However, and as a rule in nature, equilibrium and balanced order will come back and must come back even if this interdependence is altered. Besides, for Marx (1984) and Engels (1873), there is always an inner force, as well as a persistent desire for living systems parts to break away rules and stabilities, which could be best applied to what organizational forces tend to do. Additionally, they both reflected the recent modern view of chaos and transformations through their emphasis on the importance of change to retain systems' survival. Similarly, as noted by Aredley (1967), Plato represented another example of chaos and change; the division through bifurcation. He believed that even sciences are once an outcome of disorder; for instance, philosophy is a source of astronomy, and psychology and physics are considered the outcomes of wonder.

Nevertheless, some of these systems approaches have been trapped by their too atomistic perspectives; they have overlooked the relationships of dialectical forces with the rest of the systemic connections, without considering that these connections are stimulated or cued, stabilized or intensified by their environments, and even without inspecting their associations with the larger environment. Thus, for not to jump into misleading interpretations and hasty conclusions, and to better conceptualize nature's evolution, Engels (1940) differentiated between chance, necessity and chaos, as they go hand in hand in nature. He highlighted the significance of chance and chaos in nature's development processes, as well as he called for not confusing chance with necessity, where some changes might be unplanned while other ones would be a must. Accordingly, in the light of these systematic perspectives, chaotic changes can be considered as an outcome of stable systems which under environmental changes tend to yield a balanced harmony after the resolution of all paradoxes between man and nature. Yet, despite the trials in understanding the nature's evolution, the chaotic emerged reality was difficult to be translated into a specific model. Particularly, this issue called for Morgan's computerized pattern (Morgan, 1995), which came to show that although chaotic systems reflect unpredictable movements, they do display order as a whole. His computerized pattern was exemplified through the movement of a flock of birds, bats or fishes which move in harmony without colliding or getting far from each other; their detailed movement is unpredictable, yet they do display an ordered frame. Also, the illustration of Lorenz (1984) on weather forecasting conceptualized the way chaotic attractors can interrupt systems' predictability. Hence, at that time, humanity was visualized as a part of opposing laws of nature represented by chaos and transformation views, which all facilitated the way for new methodologies of inquiry to evolve in modern studies including the "Chaos theory".

2.3 An Overview of Chaos Theory

Several social and technological advancements have been generated through linearized reality. However, according to Chambers and Mitton (2017), the clarification of actual reality emerged when Hernri Poincaré discovered the concept of chaotic-deterministic systems; Poincaré laid the foundations to what the theoretical meteorologist Edward Lorenz has worked on, to give rise to a wider image in the modern organizational field through the Chaos theory. In reality, the discussions and explanations made by Marx, Engels and other former philosophers have generated the essence of Chaos theory. Yet, Chaos theory embraces further analysis of systems' survival and development, where it focuses on high sensitive-dynamic systems governed by deterministic rules and regulations (Oestreicher, 2007). According to Feigenbaum (1980), the bifurcation process from stability to periodic actions and behaviors occurs as variables are combined together, resulting in a more dynamic system, complicated behavior, and apparent randomness. In this vein, Chaos theory assumes that occurring changes are non-linear, and that even cause-effect correlations are created from different variables of different directions.

This indicates that although changes at the micro level are restricted by a pre-organized context, chaotic systems are greatly vulnerable, flexible and changeable at the macro one. Similarly, according to Levy (1994), chaotic systems make long-term forecasting impossible, where any slight modification in system's initial conditions yields to dramatic evolutions within the whole system, represented by the famous notion known as the "Butterfly effect". Theoretically, any chaotic system must come back one day to its initial state; nevertheless, due to the perfect synchronism in time and space between variables, the probability to see a system reverse to its initial state is low and same conditions will not be found again as they were (Actions irreversibility); such breakdowns and bifurcations are encouraged by Chaos theory and are considered as healthy progressions. In this manner, according to Briggs and Peat (1989), and from the Chaos theory's view, dynamic systems generate random behaviors that are attracted and limited by a given space, noted as the "strange attractors", which tend to produce an implicit stability inside the high unstable space. Particularly, this in turn produces a new order of layers which might be similar, but at different scales (scale invariance property); what is reproduced at the micro scale will be similarly observed at the larger one.

3. THE CONTEMPORARY ORGANIZATIONAL REALITY

The notions of "chaos" and "organization" have always been represented as two contradictions. Chaos, in its edge definition represents uncertainty and confusion, while organizations are looked for as being the symbol of management and linearity. Indeed, the mechanistic view of organizations has always been proposed as a prescription for their management by academic research. However, contemporary management is not a straightforward endeavor, where it is much more complex and chaotic to what simplistic recommendations do imply. For instance, and according to Rarick (2008), the application of research findings and past managerial practices through organizations' contemporary work has only shown critical failures, as their validity was not applicable from one organization to another.

3.1 Organizations as Non-Linear Dynamic Systems

According to Thompson (1967), organizations are dynamic organisms directed by non-linear relationships. He pointed out that an organization is a set of dependent parts which together make up a whole, in that each gives something and receives something from the whole. In reality, contemporary organizations are in the realm of non-linearity, where the importance of the indirect origin of organizational actions is being highly stressed by many researchers and practitioners nowadays. According to Mintzberg and Waters (1990), preoccupation with decisions runs the threat of mental intention at the individual level and the concreteness of action at the organizational one. Besides, Pettigrew (1990) recognized that linearity cannot direct decisions, where each decision is a result of multiple loops and directions. This, and at the organizations' micro level is reflected through organizational actors' contradictory frames of reference, including their changeable values and preferences that intervene at different phases of their choices, actions and evaluation processes. As a result, non- linearity takes a wider place in the relationship between action takers and the nature of their actions. For instance, strategy formulation processes seem to be systematic, organized and planned; however, deep inside they do mix with intuition, chance, and other dynamic internal and external variables. In this context, Mintzberg and Waters (1985) insisted on the significance of internal dynamic interactions in strategy formulation processes. Also, Pinfield (1986) showed that structured and anarchic organizational processes are complementary, where strategies and solutions are generated through decisions arising from the dialectic interactions of forces inside and outside organizations.

3.2 Organizations as Chaotic Systems

In the review presented above on organizations' systems nonlinearity and dynamics, it is obvious that chaos creation is an outcome of coinciding influences of internal and external forces. According to Linstead (2004), some organizational forces are known for their guidance towards stability and structure, which embrace planning, organizing, leading and evaluating, whereas others comprise research and innovation and are considered as instability attractors. Accordingly, chaotic systems do appear when these forces mingle and correlate with each other, resulting in high complex situations. Indeed, order and stability are highly required in organizations for their missions' attainment, where according to Daft and Lengel (1984), organizations should formulate common ordered standards to better respond to the confusion arising from their internal and external interactions. This perspective coincides with Barnard (1968), who considered that the survival of an organization depends upon the creation of a balance among its complex characters in a continuously changing environment. Thus, order can be identified as a necessity to empower organizational forces to have their own distinct positions in organizational structures, as well as to prepare them for the right conditions in decision-making processes. Besides, as explained by Weick (1979), order is defined as consensually confirmed grammar for dropping equivocality by means of sensible interlocked behavior. Mainly, this reflects order's ability to create more certainty that helps in reducing dissonance among managers' decisions and in enhancing management internal control. Furthermore, according to Langley (1988), the usage of formal ordered tools is a mean of persuasion and comfort for managers. She agreed with Bower (1970), who suggested that order probably has a psychological-based origin in creating power for mangers; sometimes, and when confronted with instability, it is more about the sense of having this power rather than its effective usage that reduces managers' dissonance in front of unpredictability.

On the other hand, these formal processes might be unsettling, where according to Miller and Friesen (1980), formal techniques would be costly when they lead to a dysfunctional organizational orientation. Indeed, formal approaches have helped organizations to orderly shape their systems and enhance their predictability to a certain point. However, they have increased the resistance to change and contributed to the creation of more complex situations, where order may then lead to chaos. Hence, organizations' deviation from these ordered approaches would then be illustrative in organizations' reaction to changes. Nystrom, Hedberg and Starbuck (1976) emphasized the importance of the creation of such responses, as when organizations are confronted with uncertain behaviors, they will be able to select from their arrangements to improve their capacity in responding to the new emerging complexities. In this vein, self-renewing and self-organizing notions are coherent with this initiative type of work on experimentation and organizational learning, where according to Senge (1990), being able to dive into new thoughts and experimentations develop new bases of knowledge, and organizations will then learn to learn. In the same manner, Weick (1977) suggested that such actions that are not straightly linked to the mission of the company are just means to respond to complexity and change. This is compatible with Nonaka (1988) who highlighted the importance for organizations to maintain a continuous development through open discussions and innovative conflicts, and Gulati (2018) who stressed the need for organizations' executives to balance between workforce empowerment and operational disciplines.

4. ORGANIZATIONS AND THE CHAOS THEORY

Within the organizational framework, a set of main points summarizes how organizations are shaped by the Chaos theory's approach. First, predictability is impossible on the long-term. Second, there is no definite cause-effect relationship. Third, organizations' workforce actions are a diversity outcome. Fourth, the concern about disorders' risks is lowered by self-organization, and fifth, "scale-invariant properties and irreversibility are the main components of all chaotic systems" (Grint,1977). As potential chaotic systems, organizations demonstrate an unpredictable image, where organizational forces appear to have chaotic and independent tendencies; nevertheless, through this randomness, the displayed picture for the whole organization is cohesive. This can be exemplified in ants' actions in nature, in which each ant appears to act in a random chaotic way; however, its actions are just part of a wider framework with a distinct value. Consequently, through this visualization, the second following point would be true; every individual forms multiple interactions within the environment, in that outlining a specific cause to clarify an effect is irrational and has to do with multiple explanations after an action takes place. In this vein, Quinn (1980) suggested linearized variations analysis for organizational systems to allow managers proceed marginally and modify the thrust of their efforts to make the necessary alignments in unpredictable situations; as by proceeding incrementally, predictions on the short-term might be reached. Though, this is not always the case, for there are many times where incremental procedures are impossible and large changes are needed. In such cases, initial conditions must be observed carefully, being the initial order imposed in the whole system, where any slight change there will lead to bigger uncertainty in the long-term. Hence, regardless the linearized managerial efforts, it would be impossible to predict long-term behaviors, for that it is a matter of time before unpredictable behaviors are created. Further, in alignment with the Chaos theory, the coupling between several periodic variables will shift the organizational system into new shapes through bifurcation processes. Mainly, such kind of change takes place in a discrete manner and does not follow a continuum, in that as the level of turbulence increases, adaptation becomes more complex in coping with the change; if this situation continues until bifurcation point is reached, then the organizational system will be either changed with higher capability and capacity for survival, or it will fail to make a successful change and will experience a decline.

5. CHAOS MANAGEMENT TOWARDS ORGANIZATIONS' SURVIVAL

Integrating Chaos theory into organizations requires a new managerial orientation of how they should manage within all the chaotic noises around. Currently, organizations are facing limitless turbulences that are outcomes of complexity, uncertainty, unpredictability, loss in control, and de-humanization (Kets de Vries and Miller, 1984). Hence, organizations are in need for effective measures in front of primarily four main interconnected trends, including the need for new customer orientations, certified autonomy and accountability, transformational leadership, and an agile organizations' construction.

Historically, the snowballing impacts of the above stated trends can better explain the change and development of organizations from Managing by Instructions (MBI), followed by Managing by Objectives (MBO), and ending up by Managing by Values (MBV) at the beginning of the 21st century. According to Skarda and Reeman (1990), in stable environments, managers direct and employees obey, where objectives are to be reached through discipline and rationality. However, automatic answers cannot always be given to questions from turbulent and unforeseeable environments. Indeed, this understanding has given the rise for the necessity to look for new enhanced managerial practices in this chaotic realm.

5.1 Creating a Mindset of Chaotic Systems Management across Organizations

According to Chikere and Nwoka (2015), managers are educated by the open systems theory that organizations might be positively or negatively influenced by a larger system. Given this mindset, Chaos theory seems applicable, where organizations are subjected to many changes that even the small ones can lead to big surprises. For instance, the sub-prime mortgage crisis in the United States in 2007 showed how small variations in the initial economy led to a worldwide economic breakdown. According to Denning (2011), the economic system was initially in chaos even at good times, where a small critical modification in the system yielded big results. In this vein, managers who have trouble in the impossibility of long-term predictions are also experiencing Chaos theory's assumptions, for that despite their effort in planning, forecasting and controlling, they do get stuck with "unpredictability"; according to Afridi (2013), even contingency plans in some cases can also suffer in terms of long-term forecasting. For instance, first-line managers work with their superiors to attain specific operational goals; though, any fluctuation in the raw materials' price will cause a fluctuation in the cost of goods sold, and thus the whole financial budget will be altered. Accordingly, when organizations do spread this mindset among organizational forces, they will invest their time in potential systems' improvements rather than in sterile expectations.

5.2 Operating Within Chaos and Dynamics as a Combination of Stability and Agility

According to Dolan and Garcia (2002), MBI and MBO philosophies were not based on changes and changes' adaptation, and thus they were not able to contribute to effective turbulences' management. Hence, they recommended MBV as a way for organizations to self- organize their processes, through which their values act as their strange attractors. In this manner, Babloyantz (1991) emphasized that organizations can self-organize through their strange attractors that are able to shape their systems' final image. Besides, Frederick (1998) ascribed that organizations' strange attractors have the ability to rescue organizations during crisis. Therefore, from the Chaos theory's standpoint, strange attractors can figuratively arrange a new kind of the needed stability during difficult times to help organizations retain back their order. Accordingly, MBV does not contradict with MBI or MBO, for that shared values are highly effective to the building of influential rules and objectives; values would help organizations attain a clear vision to direct their strategic change, absorb organizational complexities, reduce internal tensions, and adapt to environmental changes (Dolan and Garcia, 2002). Mainly, this given tendency for chaotic systems to self-organize through mutual values is a fact, where even internal organizational forces intentionally suggest their existence. In this vein, according to Dolan, Garcia and Auerbach (2003), the final and instrumental values are considered as the two central groups of organizational values. Final values are seen as the existential objectives that guide organizations' future and are embodied in the mission statement, customer satisfaction and excellence in products and services; in addition, instrumental values are conceptualized as the tools to achieve these final values and they include ethical values (Rokeach, 1973). Indeed, every set of values will have its own duty and effect in the organization, where final values can be considered as the strange attractors that shape the final status, and instrumental values act as the tools for organizations to self-organize. Accordingly, creating a balance between the two would help, in which values associated with development will create new paths and prospects including self-learning and flexibility, and those which are control-oriented will maintain sub-systems work and guide activities as planning, obedience and certainty. Hence, MBV will then create an adaptive organization, where a flexible organizational structure can allow the input of new variables from the environment, and then the adjustment will happen incrementally.

5.3 Managing on the Edge of Chaos is Never a Compromise

According to Singh & Singh (2002), it is not a new realization for strategic management academics that organizations operating in the comfortable zone will not be able to survive in the long-term. Mainly, when managers do realize that they are surviving within a chaotic kind of systems, with "adaptation" being their target, then they will find themselves managing on the edge of chaos. Indeed, this perspective has been supported by a bundle of managerial writings that have emphasized its establishment for the needed reactive systems. For instance, and from a psychological perspective, Richards (1996) considered this managerial approach as a way for improving managers' innovation and problem-solving skills. Yet, according to Brown & Eisenhardt (1998), there is a critical challenge lurking in operating on the edge of chaos, as there is a need for creating a delicate settlement within the "anarchy- order", and "stability- instability" paradoxes; to operate at that territory means to find a new point of emergence and create a careful rhythmic path of changes.

6. CHAOS THEORY FROM THE OTHER SIDE OF THE COIN

The need for an improved analysis to the surrounding change has arisen organization's interest in looking into Chaos theory application; yet, some of its limitations should be taken into account. According to Farazmand (2003), organizational actions' conceptualizations in terms of non-linearity have facilitated the Chaos theory's path in organizations, in which the current reality is ruled by non-linear changes that are in need to be solved through non-linear frameworks. Indeed, rationality does exist in this perspective; yet, to relegate the role of linear methodologies in problem solving and decision-making processes is irrational. Hence, considering Chaos theory as a superior framework will discard the importance of previous organizational and managerial researches. Besides, empirical managerial studies in confirming the real conceptualization of chaotic systems are few, which have left management theorists and scholars in perplexity to understand the effectiveness of the Chaos theory basis. Indeed, despite the essential role of organizations' metaphors in better realizing the complexity of organizational systems (Morgan, 1997), Chaos theory has been seen as another metaphor and not as a strict statistical tool to depend on. In this manner, according to Bright and Pryor (2015), the derivation of chaotic models is on the rise due to the current technological developments; however, these models do reflect boundless flow of data in organization's systems, reinforcing the need of the "control" concept, and resulting in less inspections of such theories.

7. CONCLUSION

"Everywhere around us and within us, we experience complexity and diversity. Everywhere around us and within us we experience change, death, and renewal, order and chaos, growth and decay that become new life. Everywhere around us and within us, we see pattern upon pattern, ever-deepening levels of complexity and variety. Why do we resist the vision or blind ourselves to the beauty or fail to embrace the learnings?" (Wheatly,1993, p.1). With these words, Margaret Wheatly started one of her articles on chaos, being a gift for order and stability. Through the eyes of Chaos theory, this gift is unique; it is a sign of change and continuity. Indeed, chaos has emerged as a new currency for managerial philosophies; however, this concept has been found for a lengthy period in nature that considering it a new science might have been overstated. Primarily, chaos is what has differentiated living systems in their evolution processes along a long history of changes and contradictions. Nevertheless, this notion has been moving along a difficult road in organizations that hold linearity in every single aspect of their work processes. In essence, the Chaos theory has arisen to lower the blackness behind the risks to change. Its attributes including the Butterfly effect, the strange attractors' conception, scale invariance and actions irreversibility properties have given significant insights on organizations and organizational forces' actions. In fact, the Chaos theory has added a bundle of distinctive views to organizations' knowledge on the current reality, reflecting all the dialectical forces opposing inside organizational systems, and demonstrating organizations' traits in being sensitive to changes and powerless to have predictable outcomes on the long-term. Yet, this theory has partially uncovered the mystery behind the conventional paradoxes on chaos. Mainly, it is not the theory that ought to be given preeminent standing over other organizational and managerial theories, in which it has not formed a rigid practical tool for organizations to facilitate their management in dynamic environments.

Indeed, it is true that disorder gives birth to new orders and chaos is the seed of newly emerged managerial processes. Yet, organizational reality is still in need for the sense of order, the sense of a structured mindset, which even if it would be an illusion to shape organizations with linearity, internal and external forces are still in need to see this limitation in mind and feel it with the heart. Hence, neither can organizations survive on linearity nor solely on non-linearity. In the 21st century, organizations will only survive and be able to self-organize when organizational forces are directed by an adequate managerial mindset and a balanced understanding of how to play on the edge of chaos towards new points of change emergence. In the 21st century, organizations should stick to the reality that chaos is not an illness, where the real one exists in organizations' attitudes in not being directed to adapt to the needed change. Certainly, within these paradoxes, contemporary organizations are faced by two choices: to leave a chance for chaos to develop as a way to create new means of order, or to reasonably search for order for not to become a home for an open-ended chaos. Thus, among the existing arguments and among the necessities to change and shape the future, the question remains: one day, and to best fit with the contemporary organizational reality, would there be a magical butterfly hovering among organizations, informing of what would exactly happen in the long-term when it flaps its wings?

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