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Complexity Theory and New Leadership Paradigm

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The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

In the last century, there have been rapid developments regarding organization, management and leadership theories. Discussions on every topic in the social sciences have commenced including approaches that invite discussion on the findings of positive science. The concept of "charismatic leader," which used to be admirable, has relinquished its place to the concept of "participative leader." Thus, leaders have started to shed heavy responsibilities associated with authority previously given to leaders. This process has led to the discussions of individuals following their leaders and become independent individuals who participate actively in management. Such approaches are becoming valued widely adopted. Mostly based on the Complexity Concept, new leadership approaches such as servant leadership, quantum leadership, synergy leadership, shared leadership and sustainable leadership have emerged, and discussions on these approaches have begun.

Keywords: Complexity theory; servant leadership; quantum leadership; synergy leadership; shared leadership; sustainable leadership; virtual leadership.

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1. COMPLEXITY THEORY

Every person is a part of the world of humanity. As in the past, today it is thought that human relations have a complex process both directly and indirectly. In common parlance, the word “complex” is often applied loosely to a situation or problem. According to [1], derived from Latin, the concept of “complexity” is based on the idea that an organism dynamically interacts with its environment, affects its environment, and in turn is affected by it. This transaction forms the basis for the concept of “Complexity Science.” Attention to the idea of Complexity Science shows its influence in a number of different areas in human life, such as anthropology, biology and ecology. Since the 1980s, the Concept of Complexity has been associated with management and administration practices, post-modernism and education science. An opinion, in regard to the education methodology field, that all institutions wishing to remain standing have to understand the concept [2]. In scientific and academic circles it has many definitions that reflect the complexity of complexity itself. There is no unified field of complexity theory, but rather a number of different fields with intriguing points of resemblance, overlap or complementarities. Most complexity theories are concerned with the behaviour, over time and space, of complex systems [3].

Complexity Theory is a very broad theory that encompasses subsistence, adaptation to change, and development. There are many early theorists who developed similar ideas in relation to a variety of disciplines beginning in 19th century with the philosopher Lewis. The roots of "Unpredictability Theory" come from the philosopher Morgan. New Zealand economist Souter and his English colleague Hodgson emphasized the importance and the unpredictability of the development. Hodgson and Polyani addressed related issues in the 1960s with their Natural Sciences and Social Sciences Development Theory. These theorists explained individual and group behavior as the action-reaction power between the individual and the environment. They proposed the novel concept that the system is in a continuous development rather than constant and still.

The “Open System” concept, another foundational theory related to the Complexity Concept, was introduced by biologist Von Bertalanffy and developed by Katz and Kahn, who in turn based their ideas on the studies of Allport. According to these scholars, an open system is a structure that lives, has members, is dynamic, experiences irreversible changes, and that can regulate itself. The organism interacts with its environment and this interaction can reveal complex changes for an uncertain and unpredictable future [1].

Open System theory regards the individual and the environment in a holistic, correlative and supplementary view rather than separately and in a reductive manner. In the Open System approach, development and change are very significant and the mutual dependence of the organism and its surrounding is emphasized. It is necessarily dynamic, wherein the individual and the individual’s environmental surroundings have the power to change each other. The Open System receives energy and information from outside, then stores and uses it when needed. Thus, the system and its surroundings adjust to one other. Moreover, such systems have a natural tendency to increase their size and complex.

The Complexity Theory is also a product of the Chaos Theory, which emphasizes the importance of studying the unpredictability of the future, the sensitivity of the system to initial conditions that cannot operationalized, and which have a non-linear nature [1]. The Chaos Theory supposes an internal capacity that contains momentary changes and shows diversity from one foreign center of gravity to another. Similarly, the Complexity Theory suggests that unpredictable fluctuations and extraordinary behaviors create development, change and diversity by means of self-organization.

The Complexity concept was developed in the 1980s, particularly in studies that took place in Santa Fe Institute in the USA. Chaos Theory left a space for complexity studies in terms of its efforts to explain how the open system works with an integrative approach. According to [4], Complexity Theory defines a system as a set of interacting parts that function as a whole. This interaction is so complex that it cannot be predicted by linear equations. Since there are too many variables included in the process, the reaction of the system to such variables can be evaluated as the "new result" of the total factors that form it. Defines this concept as anarchism. He uses the term "market anarchism” for economy management and attributes its results to action and violence (danger), alluding to the "freedom is slavery" expression of George Orwell [5].

According to [1], the deterministic universe theories of physics scientists Laplace and Newton have collapsed and have been replaced by Chaos and Complexity theories, which have implications for the social sciences by way of explaining natural events and occurrences. Accordingly, effects are the functions of initial influences affecting the starting state, but which can subsequently create large effects. All the predictability, causality, formation, universality and big association concepts suggest that the universe is a systematic and internally coherent mechanism, despite a complicated balance. For example, we cannot know how the brain of a baby will be developed at the age of 40, yet it will be a brain that functions most of the time. Complex neural development arises from multiple ongoing bidirectional transactions between the neural system, genetic endowment, and environmental influences and experiences from conception forward [1].

Starting from Waldrop's formula, Reynolds developed a computer simulation, Boids, to model bird flock activity using three initial conditions. The initial conditions were as follows [6].

a) Birds strive to remain at a minimum distance from other objects (including other birds),
b) Birds strive to sustain the same speed as other birds,
c) Each bird strives to move towards the center of the flock.

The bird flock example is quite appropriate. Importantly, the machine has no cosmological or teleological ghost that determines how the birds need to fly. Rather, the bird flocks are able to organize themselves. Complexity comes from simplicity, it is not imposed from outside. There is no single leader or central control. On the contrary, there is a participative control in this model [6].

Another concept used in complexity theory is Waldrop (1992:146) "complex and adaptive system" concept but researchers rejected it because of its system-directed, cybernetic and mechanistic associations. The "complex responsive process" concept, which is more related to human organization, became more preferred because it embraces the reciprocal interaction of individuals and groups and is thus more applicable to organizations and management. Researchers suggest that instead of considering an organization as a system, it would be more appropriate to consider it as processes of interacting people building relationships within a period of time within the context of the Complexity Theory. Such interaction then places communication in the center of the theory [1].

As suggested above, Chaos theory is also related to Complexity. The term Chaos as applied to systems first appeared in 1900, used by scientist Henri Poincare when he attempted to understand the interaction of the multiple orbits within the solar system. He concluded that equation system that predicts the movement of bodies within the solar system is dependent on initial conditions yet it is impossible to correctly identify the initial conditions. Poincare used the term "chaos" for this unpredictable and undeterminable situation [7]. Poincare showed that a linear determinist view cannot explain many natural systems; rather, chaos and complexity better explain such phenomena. The reason for chaos is the impossibility of knowing at a sufficient level the initial data necessary to predict the future.

Despite the inability to fully predict the future, Complexity and Chaos theorists suggest that that every complex event that looks disorganized has a certain organization within it. The meteorologist Edward Lorenz was central to the development of this idea during the 1960s. Lorenz discovered that weather patterns never follow a specific order and even if all other conditions are held constant, because of the influence of unknown initial conditions. He defined his theory, named the butterfly effect, as the "precise dependence on initial conditions." Lorenz noted that "a small change in the initial data of a system may lead to unpredictable major results" during his studies at the Massachusetts Institute of Technology (MIT) in 1963. He famously illustrated the idea with, "one wing flap of a butterfly in the Amazon forests may result in a storm in Europe," in his 1972 studies. It is possible to encounter multiple results that may be explained as the butterfly effect in organizations.

Lorenz's ideas are especially applicable to human group interactions involving leadership. The extraordinary capacity of any one person or a group surfacing in the events of a crisis or chaos encountered by an organization, and who subsequently solves the crisis, could be offered as an illustration. It is appropriate to look for a relation between the butterfly effect and the

leadership effect in this context. Yet, an explanation of the management and leadership theories by the Complexity Theory can be considered as a somewhat problematic point of view. For example, there could always be factors that are hard to explain from the "human relations" approach initiated by Elton Mayo's Hawthorne Studies to the present. Although these approaches focus on the complexity of organizations, the complexity of human behaviors incontrovertibly gains importance. It should not be assumed that the functioning of organizations must be explained by complexity, chaos or unpredictability concepts. On the contrary, value should be sought of scientific data in all situations and at all times. Morrison's [1] suggestion that determinist concepts in social sciences have collapsed should be considered as an exaggerated view. Although chaos, complexity and unpredictability exist within the nature of organizations, it is nevertheless necessary to use all the data of management science before everything else in order to define the future of organizations. A contrary approach would suggest a disbelief in science.

2. SELF ORGANIZATION AND SELF STRUCTURING

According to [1], there is no linear cause-effect relation in the management of organizations. Rather, organizational management involves continuously changing and interacting structures, yielding a more fluid interaction-based change. For example, the movement of smoke rising from a flame, the flow of a river, and the movement of sands in a desert lead to changes that are in turn influenced by other variables in their environments. The smoke rising from a flame is affected by the wind then further influences the environment. The river is affected by the rocks on its way and in turn affects the surface, chemical integrity, and position of rocks. Desert sands are gathered by the winds and as a result change the appearance of the habitat. To use an example from the education system, a simple in-class incident may affect the whole society by transforming into a major problem involving families, school management, and even the judicial system. Thus small local events have the potential to perturb large interconnected systems. Moreover, invariance of the environment and its components is not supported because stasis (stability) leads to the death of systems. Organizations that resist the change are condemned to becoming unsuccessful. In order for the organizations sustain their vigor, they must keep up with the changes and even create the changes. Change and unexpectedness are the necessities for an organization to stay alive. A butterfly that flies in a straight line with no zigzag would become an easy prey.

An organism reacts to the environment by redefining itself and changing in order to survive. Continuous self-reorganization is a new concept that organizations should embrace. A basic feature of self-organization is auto-catalysis, meaning to increase one's own rate of progression. Auto-catalysis can be considered to be evidence of a system's ability to change on its own. During this process, new internal conditions determine the nature of newly developing self-organization [1]. It is a bottom-to-top process, and demonstrates support of the Complexity Theory utilizing the following properties:

a) Adaptability,
b) Open system,
c) Learning,
d) Feedback,
e) Communication,
f) Resurfacing.

If an organization wishes to stay alive it should be simultaneously open and aware of its environment. Dinosaurs became extinct because of their inability to adapt quickly to a spontaneously new climactic condition following the collision of a giant meteor that collided with the earth. A system that is unable to adapt, one that is not sufficiently agile and fast, will not be able to subsist. A system should not rely on internal observation and closeness in order to remain alive; it should be open to the environment, it should be sensitive, responsive, and able to shape itself [6].

A system that is able to organize itself is not only an auto-catalyst, it is a self-creating structure at the same time. This, in turn, gives the living system strength to become an idiosyncratic and autonomous identity, able to ensure its continuity and renewability in time. A system creates the conditions necessary for its continuity itself, for example, by creating specialization in response to needs. In education, a school can be a center of perfection in terms of art or science, [8] as a response to changing vocational and community values. According to [1], change can no longer be supported by linear management models. Organizations must constantly self-modify and disavow the linear management models

supporting the linear command mentality of hierarchal and bureaucratic organizations. This property is articulated as the "Kaizen" principle of the Japanese industrial system, which is based on continuous development and cooperation.

Self-organizational and self-structuring oriented leaders should strive to develop themselves towards a democratic, individually centered, and relational leadership paradigm that is far from the command mentality [1]. Leadership in developing self-organizing organizations requires substantial emotional intelligence in order to support and develop positive relations among individuals. Shared leadership adopts more humane principles, develops the school's organizational health and creates a positive climate of reciprocal trust that is far from being compulsory and authoritarian. Thus, it creates a safe environment for undertaking risks and encourages mutual dependency, communication, cooperation, differentiation and self-organization. In order for all these to be successful, the leadership needs to address the personal and inter-individual humane aspects of organizational life [1].

The hierarchical (command – order) leadership style has come under a lot of criticism. It is possible to see a considerable number of new approaches in leadership style along with the Complexity Concept. It is useful to examine some of these approaches within the scope of this paper. So far, new leadership concepts have been discussed via the Complexity Concept and Quantum Theory. These are, Servant Leadership, Quantum Leadership, Synergy Leadership, Shared Leadership, and Sustainable Leadership. However, when transformational leaders within the Complexity Theory exhibit a linear, predictable and controllable behavior towards non-linear structures, they may not be able to execute the desired transformation within the organization [9]. It is possible to find hundreds of leadership related definitions and approaches in the literature. Certain properties that are looked for in leadership may even surface as a new leadership theory or leadership type. Approaches based on Quantum Theory claim that there may be results that cannot be explained. With an understanding that partially supports contingency approaches, researchers claim that in leadership there can always be facts that cannot be explained, and not all of the same facts give the same results, not unlike the quantum theory concepts and in opposition to linear behavioral approaches. A discussion of some new leadership concepts appears below.

2.1 Transcendental Leadership and Servant Leadership

Transcendental leadership is a leadership understanding that mostly addresses the motivation and agenda of the participants. Transcendental leaders look at the needs of the stakeholders and focus their efforts on defining those needs. Transcendental leaders are related less to their own agenda and more to the development of the viewers' agenda. They wish to contribute to the personal development of others, to meet their needs and ensure their wellbeing. In other words, they prioritize others. This is a characteristic that is not present in transformational and democratic leadership [1].

McCauley [9] used the "Knowing Leadership" concept and advocated the power of knowledge in management supported by the expression "knowledge is power." According to Transcendental leadership, the role of a leader is mostly to adopt common power and decisions, develop a social spirit and a synergy within an organization with group-focused approaches [10]. This type of servant leadership has a long history in the field of religion. The leadership involves a broad concept of existence and a sort of servitude spirit. According to [6], instead of the organization belonging to a single individual, it is important to accept common ownership and reciprocal dependency, which in turn creates a citizenship and social spirit. A servant leader simplifies the uncovering of the views and goals of others and assists them in creating their future.

Servant leadership is designed to support the sharing of the social spirit and decision-making power. The servant leadership requires a democratic understanding in management and such leaders need to ask themselves following questions [10]:

1. Do people served by you undergo development as a result of your leadership?
2. Do the members that receive services transform into more healthy individuals?
3. Do they become more self-reliant, more liberated and more efficient?
4. Do they themselves transform into servant leaders?

5. Can non-priority individuals in the society benefit from my leadership?

Servant leadership has 10 properties [11]:

1. listening (to oneself and to others),
2. empathy (empathy towards others regardless of their differences),
3. improvement (bringing the people to a whole in terms of emotional state),
4. awareness (be aware of oneself and others),
5. persuasion (instead of depending on one's status power),
6. conceptualization (to think big),
7. common sense (includes the use of informed foresight),
8. management (governing the organization),
9. dependence on the development of people (covers the professional as well as personal development),
10. creating the team spirit (especially in large organizations).

The leadership behavior of an individual in a servant leadership role incorporates modesty. Servant leadership has transformed from a hero leadership model towards a simplifying leadership position. A servant leader is not in a search for personal ascension. There is no single and best leader behavior in the servant leadership understanding as it is in classic leadership theories. Transition from individually driven leadership towards servant leadership can lead to an important paradigm change.

2.2 Quantum Leadership

Suggests that the complexity concept and self-organizing organizations depend on quantum leadership. Such organizations are in a continuous state of motion and fluctuation; such a state is a part of their reciprocal dependence [6]. Quantum organizations are those that develop based on complexity, uncertainty, creativeness, integrity, self-determination, flexibility, transformation, personal leadership and relationships. Quantum physics emphasizes the uncertainty aspect; nobody can exist independently from everything [20] suggest that quantum leaders take a role in creating the necessary energy for being innovative and for the organization to develop. However, they emphasize that it requires skill and creativity. A leader needs continuously to develop new understandings, test personal perceptions and actions, and strive for personal development.

The defendants of quantum leadership point to its origins within quantum physics. They advocate that the leadership roles need to transform from simple management to creating rich environments where self-organization can take place [12]. According to quantum physics:

1. Things that move as particles may appear to move in waves, while the waves may move as particles.
2. Even if we create something by repeating everything in the same manner it may not result as the previous occurrence, meaning outcomes are inexplicable.
3. The observable has effect on the unobservable.

Taking a start from all this, according to Quantum theory, sub-atomic particles influence one another from a distance. This idea is contrary to the philosophy of the science in that distal influence is not typically addressed. According to the determinist point of view, when the occurrences are the same the results shall be the same as well. In contrast Quantum theory rejects determinism such that occurrences taking place on the macro level may not take place on the micro level. That is, it may not be always known how a substance might behave.

Quantum leaders declare a common vision, improve organizational culture, support the followers' self-development, nurture relationships in a cooperative and understanding atmosphere, encourage the followers and emphasize human beings and human oriented organization. Quantum leadership is a process rather than a title and an action rather than a subject [13]. Quantum leaders manage and develop an organization's relationship with its environment by affecting the system in order to create change, ensure rich information transfer and enable organizational learning [1].

Quantum leadership is a new paradigm foreseen for advanced organizational structures that is not consistent with the traditional management understanding. In contrary to the classic physics rules, quantum theory endorses unpredictability and undependability. Leadership success involving non-linear, extremely complex and unpredictable outcomes can be explained by quantum theory. In fact, the success of such organizations is neither linear nor predictable. Rather, there is a dynamic relation between the leader and the viewer. Moreover, the leader needs to use quantum and transformational

leadership skills in order to create the future [14]. On the other hand, suggests that quantum leaders need to perceive themselves as a whole with the management workers. He suggests that the leader should to prepare an environment for the creation of a common future with them. A leader should inquire about their team's needs and ask, "how can I support them?" The importance of creating an environment with a high level of acceptance of "reliability" and "openness" principles. He emphasized the importance of the formation of an effective team and advocated fostering the self development of team members and the valuation of their knowledge [15].

Quantum leaders will be able to establish a more effective interaction in order to develop the basic adequateness of the organization, will search for new paths and ensure that the system will have a directive, a goal, and an action plan. Quantum leaders acknowledge the skills of the organization workers and deal with ensuring and simplifying their interaction with new methods. Effective quantum leaders understand the importance of motivation and know the importance of a positive individual interaction. In quantum leadership, as much as the order requires liberty, liberty also requires order [1].

2.3 Synergy Leadership

It is difficult to form a common understanding of a definition and understanding of the Synergy Concept. Giving meaning to the synergy term is as difficult as the meaning of the expression "in order to understand the future one needs to look at the past." It is ambiguous and vague. Synergy is not something that we can touch, however, we may define it as a "multiplier effect" in individual efforts or as an "increase effect" in joint efforts. The basic principle of synergy is that the combined effect of the force resulting from the interaction of at least two factors is larger than the individual effects of the multipliers. The proverb "two heads are better than one" is the best example to explain synergy. Two or more persons benefit from each other's ideas by means of the collective thinking. In this case, the efficiency obtained from personal energies is larger than the total of parts [14].

The dictionary definition of synergy is given as the common desire and power obtained in order to execute and finalize a certain job. The concept of creating a synergy is used in the meaning of obtaining force by jointly activating several factors with the ability to contribute to a result. Moreno's sociometry asks people living and working together about with whom they would like to live and work. Studies show that efficiency increases and error rate decreases in teams formed with people that reciprocally chose each other.

Synergy is the combination of human energies. As with everything that is combined, when synergy is created, it has greater energy than the energies forming it. In this state, the synergy is not only the combination of energies; rather it is a product of management that produces more energy from the existing energy. For leaders to create synergy, they need to posses the abilities of empathetic listening and the skill to express their ideas and views without losing respect for the ideas of others. Synergy comes from inner interaction and what such sincerity and interaction can produce is extraordinary [16].

The synergy leadership concept is defined as establishing an ideal vision for the future by providing organization and infrastructure support that develops the organization. It is thought that it is possible for organization members to raise the organizational performance to the utmost level by using collective, parallel thinking, and cooperative work. In contrast, methods that ignore cooperation may minimize organizational performance or even cause failure [14].

2.4 Shared Leadership

The notion of shared leadership is an absolute must for a developing organization. Leadership is a result of knowledge-based organizations. Organizational knowledge is within the mind of every employee whether it is shared or not. In actuality, shared leadership represents "collective self leadership [17].

Leadership in complex organizations is not only related to the power and hierarchy of senior people. In fact, a leadership role may not be equivalent to the person's position in the hierarchic structure. Leaders may be present at any level of the organization because leadership is related to an behaviors rather than position. Certain researchers advocate that leadership needs to be separated from hierarchic relations because leadership derives from sharing of power rather than the application of power. Those researchers working on the Complexity Theory indicate that divergence is the most

important part of education and advocate that divergence arises from an individual's relationships with others [1]. Therefore, since the shared leadership team has a cooperative process, leadership behaviors comprise leadership activities performed by not by one person but by multiple persons.

Leadership has four main components [18]:

1. Accountability: Results achieved and roles defined are accounted for; nonassignable.
2. Equality: Contributions of each individual shall be defined equally.
3. Partnership: There is a mutual relationship of respect and trust between the individuals.
4. Possession: There is personal loyalty and ownership towards the organization.

In shared leadership the team members participate in adopting decisions and defining the goals. The team bears the liability resulting from such decisions as well. In this regard, self-determination and accountability are distributed among all the members of the team [19]. A senior management member plays an important role in creating a leadership culture in order to influence and direct the team members with the goal of bringing the team potential to a higher level [20].

Shared leadership is thought to be a behavior rather than a role or a position in a hierarchical structure, and no one is expected to show leadership in every setting. In contrast, leadership is seen as a web of relationships between people, structures and cultures rather than the effect of a single administrator. Leadership in the shared leadership paradigm is not an individualized issue. It extends to intertwined and complementary leadership roles that can move from one person to the other all over the organization and it is shared and implemented by several people [1]. The importance of having multiple leaders in organizations within the complexity theory because, according to the complexity theory (as in the chaos theory), small actions have large effects and individual actions may lead to major results [21].

2.5 Sustainable Leadership

For an organization to change its position and for the change to be constant and not temporary, it needs to be attached to a leadership understanding that ensures stability and affects the organization on a long-term basis. Sustainability of leadership requires establishing a relation between the past and the future of the organization that honors the continuation of changes [22].

A leader in a sustainable leadership style should migrate towards practices that can determine the future, starting from the first day, and delineate sustainable and permanent practices that ensure continuity. A founder leader of an innovative school should not only care for the establishment process of the school but also for the issue of hiring and training the best teachers who can maintain permanent success in his or her wake. A good leader does not maintain organizational success by the limits of his or her personality only, but by the permanent success of the organization. The leader should avoid practices where one is considered superior over the other, and should eschew unfairness or injustice [22]. Leaders who can keep these universal principles permanent are assumed to be guaranteeing the future of the organization in terms of these principles. On the other hand, the leader should try to protect experienced staff. Caring about professional development involves collaborating on decisions together with his or her staff.

Sustainable leadership can be defined as sustainable improvement of the organization over time. The leader bears a common responsibility with his or her teammates towards the former and future leaders. In sustainable leadership, sustainability takes into account the consumption of human and material resources instead of unnecessarily consuming the organization's resources. A sustainable leader avoids negative effects on the organization, environment and society. Rather, he or she undertakes an active role in matters considered to be important by the society. As an effective activist, such a leader creates an environment that provides organizational diversity. Sustainable leaders encourage successful applications and share knowledge and development. Spencer's seven principles of sustainable leadership are as follows [22].

1. A sustainable leader creates a learning environment and ensures the sustainability of that environment. This means nourishing the organizations in order to make it last over time. The function of a director in a school is to support the mental, emotional and social development

of students. Success is important, but the important thing is not to achieve a successful result but to ensure the continuity of the success.

2. Changes are not short-term, temporary and limited to individuals. Sustainable leadership is not a kind of leadership that can be successfully carried out by only charismatic leaders. The leader needs to create a structure with an effect extending beyond the organization by assigning importance to chain expansion of actions instead of a restricted area of effect. The effect of sustainable leadership should reach to the former and future leaders of the organization.
3. Sustainable leadership should support the leadership of others. Sustainable leaders are the leaders that prepare and develop the future for consistent heritage. The success of a sustainable leader is shared by other team members. Autocratic leaders do not want others interfering in their decisions; they reject approaches that might change their traditional practices. Sustainable leadership is a shared authority and a common responsibility.
4. Sustainable leadership eliminates social justice issues. Sustainable leadership deals not only with improvements, it also deals with the sustainability of the improvements.
5. Sustainable leadership produces and develops more human and material resources than it consumes. Sustainable leadership should focus on the creation and development of resources by being aware of high-demand and deficient resources. It should aim for a long-term improvement rather than for a short-term gain.
6. Sustainable leadership provides environment diversity and develops that capacity. Innovative schools should prefer provision of improvement by creating diversity instead of standard practices.
7. Sustainable leadership is an innovative behavior. It should support innovativeness in the society and, if needed, advocate the innovations in the media and participate in dissemination.

In summary, leaders should aim to leave the "change and expand" concepts as a sustainable heritage when they leave their position [22].

2.6 Virtual Leadership

Virtual leadership results when an organization establishes communication among individuals and groups within a virtual environment. In this type of leadership paradigm, communication technologies facilitate the exchange of knowledge, emotions, thoughts and behaviors and social interaction among all stakeholders.

The basic properties of Virtual Leadership are as follows:

1. Virtual Leadership is based on technology and it arises due to the use of technologies. Its main power source is telecommunication.
2. Virtual Leadership is post-hierarchic; it can be carried out at any stage of an organization. Generally, it has no rigid hierarchic structure. Coordinated understanding is the goal.
3. Virtual Leadership is shareable; it can be owned by one person as well as shared by team members varying from time to time.
4. Virtual leadership is interactive; it is open to interactions within the organization and between organizations. Such interactions may operate bidirectionally.
5. Virtual Leadership is systematic; relationships and interactions are carried out as a part of a system that are affected by other systems.

The basic property that differentiates virtual leadership from traditional leadership is that the relation between the leader and the team depends on the communication technology between them [23]. Even if the traditional leadership understanding and organizational structure remain the same and only the communication methods are carried out in electronic environments, then we are still talking about virtual leadership [24]. Creating and developing the relationships between organization members within a virtual environment significantly defines the virtual leadership. The main difference is the execution of cooperation in virtual leadership is carried out in a virtual environment. In this case the principal goal, as is always, is to distribute the knowledge necessary to support the organizational goals. For instance, a virtual leader may send an email in order to inform the members regarding a change. Then the organization members may discuss among each other and/or notify the

leader by a return email. In this case, the virtual leader benefits from communication technologies in order to inform the organization members [23].

Relations based on information technologies are not less effective in comparison with traditional face-to-face communication method. In fact the same content and methodology may be applied in the virtual environment as typically occurs in an organization [24]. Despite the spatial distances between organization members, virtual leadership may be inspirational commensurate with traditional leadership that has the advantage of physical proximity. For instance, a virtual leader may contact members in an electronic environment in order to share their visions or before adopting any decision in order to receive their views. As a result, all participants can create a knowledge pool using an electronic environment.

3. SUMMARY AND CONCLUSION

Increasing use of the Complexity Theory in scientific fields as deeply affected management and leadership practices, particularly in relation to organization-individual paradigms. There are two primary trends to consider. First, although the combination of complexity and chaos theories together is supported by scientific research in fields such as mathematics, there is much that is unexplained affecting our application of the theories to management and leadership. Secondly, complex and inexplicable human factors are more important than the type of information generated by scientific studies of the theories. As such, the scientific methods need redefining to better fit them to managerial needs. This trend rejects all dialectical propositions. Unfortunately, wholesale rejection of these theories has resulted in negative attitudes towards scientific research. Although these attitudes may not be visible in the literature, they do exist.

Respect should be shown for each of these trending opinions. However, there is no other reliable methodology on which we can rely. This research takes place in the arena of science. Discussions should always be kept within the boundaries of scientific scholarship, and value afforded to the efforts of people trying to obtain scientific information. Science can only indicate what is possible. What will happen will be determined by what people do.

The Complexity Concept results in the emergence of new leadership concepts opening new perspectives for continued discussion about leadership. The expectations of the internal and external settings of organizations have changed; the historical approach suggesting that a single leader can overcome everything has started to be challenged. In the leader – follower relationship, the leader who is being followed has left his place to a leader who shares his authority and makes an effort for autonomous individuals. On the other hand, differing views about leadership have emerged. For example, the absolute characteristics possessed by the leader as mentioned in characteristic theories, or as is mentioned in behavioral theories and in mathematical equations for which behaviors are exhibited, and where sophisticated human communication inputs could result in complex and unpredictable outputs. This review brings a new point of view to research related to management and leadership through which it is hoped that further discussion will emerge among scholars and practitioners in the field.

Following conclusions are offered for discussion based on the information acquired from leadership approaches discussed in this review:

1. The effect of a leader's behavior on the viewers cannot always be predicted.
2. Leader and viewer relationship may not be dependent on linear causes and results.
3. Organizational structure is complex, and therefore, the leader-viewer relationship can also produce complex results.
4. Since the foundation stage of the organizations, the beginning effect is important for all conditions within the organization. Each event or occurrence shall be considered with regard to the initial conditions at which they occurred.
5. When it is accepted that every chaos and complex structure has a certain balance within itself, the chaos situations in the leader-viewer relationship may also have its own inner-consistency and balance.
6. Organizations have the capacity of self-organization; leaders, as a part thereof, shall have the capacity to know the organization's organizational strength and to benefit from such strength.
7. Leader's effect on the organization is not independent from all the other internal and

external effects of the organization. Every organization is a part of all other systems.

8. Organizations have no fixed structure; in this regard, the leaders should be representatives not of the stability but of the change.
9. Every leader should make their leadership sustainable by connecting the past, the present and the future and should guarantee the sustainability of development after their time.
10. A leader should be able to acquire the minimal benefits of technologic developments and shall not be afraid of sharing their authorities.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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