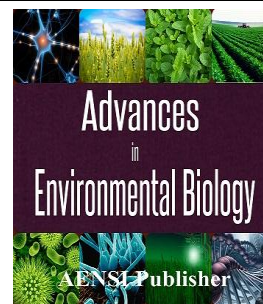




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“Chaos Theory and Its use in Strategic Management”

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ABSTRACT

Undoubtedly in ago decades, great revolution in nature science was accrued. This revolution has been change phenomena perception and explanation way and the world is not collection of systems moved matching with nature algebraic rules predictably and recognizably. This issue can be generalized in management and organization area. This metaphor is representing phenomenon in now age called regularity in irregularity theory or Chaos theory. This opinion proceeds studying existent all elements reactions in dynamic text, allergy relate initial positions, recognizing models repeatability from retail to total and showing hidden models. Chaos theory is as now way for strategic decision making in chaotic and irregular environments. Strategic management is a effort for organization control and perception that happens in the environment. Strange attraction in management has more clarity in comparison with other areas. Strategic programming may not be except a hallucination but Chaos theory with their procedures and Solutions for solving this problem and organization future views and organization culture and mission is used. Management strategic is based on sort of programming which is almost universal and defines a frame for organization assessment and its future. Considering organizations as nonlinear systems obtains a new type of strategic programming process. This issue purposes in addition to presenting this theory to explain its usage in strategic management.

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INTRODUCTION

Nowadays Islamic Revolution in nature sciences is progressed. The world operation method just as scientists had understood and explained its has been reversed completely. Already scientists were imagining worlds as collection of systems moving conforming with nature algebraic rules predictably and recognizably. Hence, they believed that effects are specific cause's resultant linearly. They were producing their explanations in regular and Specified formats. Now they emphasize chaos and irregularity creative role and know the word as collection of systems acted to self-organizing methods. Results of this life way are existence of random and unpredictable situations. But in these conditions, nature algebraic rules are governing as before and realized systems act rotational way in which irregularity causes regularity and it's opposite. Nowadays simple image of world active method has been replaced complex and paradoxical image. This new knowledge is named complexity theory and aspect of this science attracted all attentions is named Chaos theory or regularity in irregularity. Final order or regularity in irregularity theory gives us complex issues resolution tools in full change and turbulent environment now and future. Chaos theory hits first impact to management tradition paradigm body and will form new paradigm basis in management and other related sciences. Scientific management, human relationships, quantitative and amount management and systematic management becomes myth and today realities in irregularity and Chaos theories with special features are appeared [4]. Morgan says: complexity theory has this message for management that it can no more be rule organizations through hierarchy goals or predetermined logic. They must learn appeared events and changes in time. In our daily world, irregularity, chaos and Chaos manifest unpleasant meanings showing lack of organized and nonage in the current process. In our discussion irregularity and Chaos do not mean none organized Inefficiency and clutter. Irregularity is dynamic phenomena random and unpredictable aspects to have their special features. Irregularity

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is a sort of final regularity. It is disorder for unpredictable result and regular for having kind of Finality. However irregularity carries a mathematical concept but probably can not be define it very exact. It can be know as being accidental with finality. Chaos or final order theory is a collection of methods and models for studying nonlinear, dispersed and disorderly issues which being accidental is in its interior [5]. Perhaps bigger role of Chaos theory be in management strategic in higher level of competition, growth and even providence. Its usage may be in duration level that often as each activity first goal has mentioned. In the dynamic environment, each person or each company according to compatibility with changing positions is survived [1]. When organizations as appearing and completed dynamic systems were considered, performance finds other shape. The activities into an organization during time cross several possible ways a managements tend before any change to know activity way. Irregularity is double-edged sword that on the one hand, says a defined system with a little uncertainty by developing uncertainty can made things which sound accidental. On the other hand what sounds accidental may be really have defined structure and if its defined structure can be obtained, short term forecasts can be done. Therefore irregularity predict on short term forecasts but long term issues based on it can not be anticipated and we try to benefit from short term forecasts [2]. Mintenzberg and Vaterz (2006) show organization strategy process is not just based on deliberate and intentional process and generally is involved with more dynamic interactions [11]. Active and dynamic organizations appearing complex and nonlinear strongly are coincident on the final order theory and with following final order model very efficient performance can have been had. Static and classic structures with linear and tradition models will reduce capability of this type of organizations and make it lack of quality. This matter which everyday we witness inefficiency of this type of organizing. This essay introduces chaos theory to readers and precedes its relation with strategic management totally and strategy various dimensions consist of planning, forecast and studying effect on organizations separately.

Literature review:

Introduction to Chaos Theory:

Chaos word is defined traditionally as irregularity, Chaos and kind of total confusion. This word is lack of any structure or regularity [1]. Chaos theory or nonlinear systems theory means the apparent lack of discipline in a system that yet has special methods and rules fitting its. Prevalent irregularity difference with Chaos is at this point that irregularity is like turbulence of a position or situation but turbulence or final order theory is sort of systematic irregularities or regularity in irregularity [5]. In simpler expression, the Chaos theory main idea is that in each disorder is hidden special irregularity. Therefore, phenomenon which in smaller measure seems irregular, sporadic, accidental and unpredictable, in bigger measures is regular, stable and predicable [9]. Discoveries' doing about nature of complexity by scientists and mathematicians has made new light on algebra and authority in social systems including possibilities and impossibilities for economy politicians and managements. These main discoveries are related to nonlinear feedback systems properties. First step in knowing how complexity scientific theory make light on authority nature is that nonlinear feedback concept in human organizations and since people interactions on each other has realized [12]. A linear relation has one special cause and just one effect and a defined action results just one outcome and just one. But in nonlinear relation of a special cause or defined action can have multiple different outcomes or effects. On the other hand, linear equations have just one solution and naturally can be solved easily but nonlinear equations have more than one solution and any conclusive way is not for solving more of them. Linear systems are collection of their constituent elements. A linear system to its various elements or components can be broken down and each of components can be studied and then with putting together these explanations to kind of general explanation from the whole system can be achieved. But in nonlinear systems exist a synergistic means the systems generality is a higher or different thing from total components or elements. Nonlinear feedback systems are very sensitive related to initial conditions. This matter means very minor changes in system can make main qualitative and quantitative changes in this system behavior [1]. In chaotic systems, small disorganizations increase on nonlinear relations, unrepeatable nature and active chaotic systems. As systems finally sensitize so much conditions change to make very hard forecast. Basic issue is effort for measuring limitations in unlimited words [7].

Chaos Theory Historical Background:

Newton during seventeen and eighteen centuries creates revolution in science which causes to make more new views and theories. This theories established exciting atmosphere in scientific community. Accordingly, systems have predictable behaviors and about their future behavior can be opined conclusively. That time believed that if change in system is done, its outcome was proportionate with initial change and its effects can be anticipated and even from little and minor changes can be prevented. Einstein after Newton with his relativity theory expressed predictability to another way. But in 70 ad, several thinkers established movement against pragmatist Newton and relativist Einstein and with Hanzberg theories adjustment proceeded new area of thought named irregularity or chaos [8]. Henry Poynter, chaos theory father and first winner of King Oscar prize,

discovered reciprocal motion of three or more heavenly bodies in their orbit can be showed dynamic and unpredictable behavior and since that time, chaos was born (not with this name) [8]. Therefore it can be said that chaos theory started with Lorenz activity. He turned it to a science in 1963. He for atmospheric Systems simulation used nonlinear equations. In his studies, he discovered small changes (even thousandth) in early conditions make result large changes. He used this example that if a butterfly flutters, whether the butterfly wings collision results with air can be caused storm in Texas? Fingsbam was one of another science theorist. In 1976 year, after doing his continuous and initial researches during 2 months, he could give generality universal theory in form of chaos topic. Universality means finding predictable specifications and features that in ponderable ways same category is existed for all things. Benvit Manel performed important role in appearing this theory. He, for the first time, used fractal term for irregular contextures pictures description like mountains contexture in 1975 year [8]. Gerik (1987) and Persivel (1989) explained its historical process and Stoard (1989) and Jensin (1987) proceeded to elucidate basic contents of this theory. However chaos theory developed in physics background at first, Raziski, Balter and other teammates knew economic and ecology, social systems by nonlinear relations and complex interactions are described. This recognition has caused creating quick approach in chaos theory usage in several areas of science, ecology, medical, international relations and economic. Chaos theory was passing hard and long way until arrived here. Now with knowing few historical evolutions, it is not bad to precede its purposes and specifications.

Chaos Theory Features:

Equations systems in chaos theory have several specifications that point them:

- 1- Chaos equations are nonlinear and repeatable.
- 2- Chaos equations have self-consistent feature.
- 3- Chaos systems have strange attractions.
- 4- Results of these equations are strongly impressed by trivial changes in initial conditions.

Self-consistent Feature:

In chaos equations, descriptive models are showing a resemblance between parts and whole that each model part is like whole. This feature is named self-consistent [1]

Butterfly effect:

Lorenz, aerologist scientist, in his researches wonderfully found these conclusions that a trivial change in anticipant equations initial conditions of meteoric situation results very high alternations in their conclusion. Lorenz named it butterfly effect in this means that if a butterfly flaps in Pecan, from wings motion trivial effect may be caused a storm in NewYork. Petty little changes is one of chaos systems main features and from it as a indicator for known can be benefited [1]. Small differences in initial conditions may be occasioned very wonderful changes finally. One small mistake at the beginning will make irreparable miss at the end. Impossible forecast in confused systems and smallest change in first conditions can create wide different behavior. This system sounds to move irregularly and each little turbulence into them can have hard change in whole system. Just a petty change in first condition can create hard change in system long period behavior. In mathematics, 2 number effects on calculation are totally different from 2/0001 number effect [8].

Strange Attractions:

Attraction word has been taken from views in which one system in place with nearing to an attraction factor impresses after a while and takes its situation to itself. Dynamic systems attraction way by attractors is like butterflies absorbing light. Butterflies jump from one side to other side and pass desultory and different ways, but finally all of these irregular movements finish in one point and butterflies absorb light. In this method, dynamic systems move in each direction to achieve attraction area [1]. Attractions have various type such as constant, two limited, sphere and strange attraction. Strange attraction unlike other types having a regularity and predictability are irregular and some of them irregularity attractions have been named. Irregularity attractions are strange but all of strange attractions are not irregularity necessarily. So strange attraction word is more correct. Strange attractions are not without model and follow a pattern and their value is in having method. These attractions have complex geometric features and wrong dimensions. Their way is interlaced, multi-directional and wide. In strange attraction any way does not repeat and each direction is new way for itself [1]. Strange attraction has been taken from carving geometric pictures by Inca people in Peru desert that if looked them close-up, not show any irregularity and not manifest meaningful image to mind. But if we look it from the sky and distance, see trees, animals and birds. Strange attractions exist everywhere. Whatever we see irregularity and chaotic in first view shows irregular method itself in the long time and with repeat [6]. Strange attractions say us being holistic and having systematic and wide sight to what extent can help us in knowing our around systems. Frequently, in management book face this issue that administrative executives and managers obligate to have comprehensive sight so that quite will have dominated whole of systems and relation into it and

this is one of successful leaders' secrets. This is strange attraction [8].

Self Organizing:

Disordered organizations in today changing environment act with their area as living creatures and for success must be creative. But when system near to compatible balance for protecting dynamism need to inner basic changes that these changes instead of suitability with area cause dynamic compatibility and its conclusion is dynamic relations alteration between people, behavior patterns, work patterns, sights and treatments and cultures. In these conditions pretty change can cause major change in system behavior and butterfly effect is crystallized with dynamic compatibility [8]. Self organizing systems have degree of awareness related to their present situation and its difference with generally favorable situation. They can reconstruct themselves based on their previous information. Final purpose in self organizing is assistance in system modernization and renewability. In living systems, self renewing process is evolutionary mechanism for system permanent elevation security. Renewability systems have potential possibilities for their organization renewal with methods, which in addition to retaining their identity, regulate for changes. Therefore these systems for existing in changeable conditions can be adjusted [3].

Dynamic Compatibility:

Disordered organizations act related to their area as living creatures and a dynamic compatibility is established between them and their sides. These systems that Vald Rap named adaptive complex systems have been succeeded and in nature and according to dynamic compatibility protect their permanence during time. Adaptive organizations have some feature. First, they are self control and self order means each of them has independent members that act autonomously without receiving orders from general unit. Second feature is organizing manner, parts relations together and connections complexity between them that can cause a synergetic unfavorable status a gives systems power resulting from sum of every single components power. Third feature is learner property. These systems can learn through feedback and this feature in their inside has been devised and does not have external aspect for them. Mutually, parts peripheral factors behaviors have special connection together and show reaction toward them. Morgan knows self order property in systems follower of 4 principles. First, the organization must have capability of feeling and understanding environment and attracting information from it. Second, the system must able to establish relation between this information and its activities. Third, the system must have awareness ability from digressions. Forth, it must have corrective activities performance ability for resolving problem. Whenever these 4 principles are established relation between system and its area creates and systems become self order and mutually events show sagacity itself. Other feature in adaptive complex systems exists a flexible specialization organizations need to a series of various specializations that since environment and changes alteration readiness in them is existed. With acceleration of area changes organizations and their specializations according to Vald Rap word must be involved a magical and eternal creativity till their duration and life would have been guaranteed. Conforming to Chaos environments needs to flexible organizations and specializations and this main element exists in today systems destiny [1]. Indeed, flexibility and continual control by designing organization and purposes and executing effective strategy for opposition with chaos and change [10].

Reflection of Chaos Theory Sights in Strategy Management:

Self consistent and its effect in strategic management:

Self consistent or similarity of portion with whole in tree leaf and snowball is seen and in holographic is distinguished. Holographic is one of laser feats that records information as light and sheet named hologram so that whole reflects in all components. Self consistent feature or holographic can be use in causing equation systems and methods are designed that each its unit be able to market analysis independently. Self consistent feature can create coordination in system components behavior [8].

Butterfly Effect and Its Influence in Strategic Management:

Butterfly effect show position that into it system has being sensitized and trivial change in first conditions results extensive changes. Managers with developing their perceptible skills and controlling area and creative factors must be recognized knowing structure, processes, system weaknesses and strengths, sensitive supports. So with using butterfly effect and petty changes and spending little strength and expense in system lever localities, they can increase staff obviously [6]. Butterfly effect remains influences in decision making ways too. For example, in gradual and trivial model determiner try with causing a first change in decision to ready it for next position. For instance in one of budget items petty increase and in another petty decrease is established and getting ready all budgets with a trivial change for next year is expected. But in the chaos theory is seen a small change can result very great changes and obtained crisis and metamorphose means. Therefore it can no more be used this model decisively and surly. Because a trivial change in action conclusion will not cause trivial change [1]. Butterfly effect give quite and rational from behaviors and decisions of successful and creative managers

who with low energy and suitable action can obtain causes of great changes and wonderful successes for organization. Economic institution or organization, that be able to use from one main point means partnership and tendency of people and summons them to tendency in its activities, will be able to realize huge acts with means (Nesai, 2009).

Strange Attraction and Its Effect in Strategic Management:

Strange attractions finding regularity in irregularity remind as rich dealing. Severs changes, irregular behavior, unpredictable alterations, critical acts, all of these will be finished to model that its detections is cleaner art until a predicative is produced. Strange attractions occasion dealer that found models for ordering irregularities and explain disturbances in regular form. Having systematic view, considering long purposes and thinking extensive area helps dealers to find patters in apparent phenomenon that give news from final irregularity a dealer needs to find strange attractions that clear this final disorder. Without notice from this order, any right explanation and prediction from today complex events of financial markets can not be acquired [8].

Self-Organizing and Its Effect in Strategic Management:

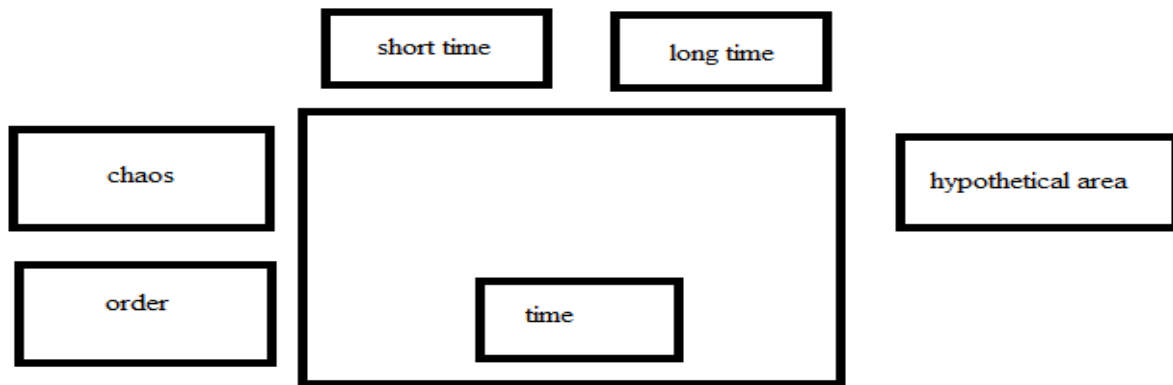
Long time development is spontaneous self-organizing process that may show new strategic ways. Spontaneous self-organizing is an efficiently reciprocal balance and learning groups. Management must be benefited from reasoning by comparison and dramaturgy.

Dynamic Compatibility and Its Effect in Strategic Management:

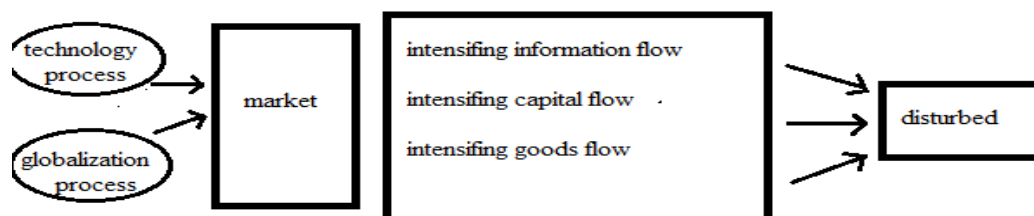
Compatibility with market revolutionary needs to flexible. Dealings systems a flexible specializations and this win element is in toy dealer's success. In organizing dealings rules in revolutionary area and with chaos theory view, components and dealing method together must be this way that first, each components meantime doing its responsibilities independently dynamic and synergic relation with other can be had. Second, each component for purposes a same view with other must be had, but for practicable behavior these parts in their collection realize various purposes and became different with each other [8].

Chaos Theory and Strategic Management:

Perhaps bigger role of chaos theory in strategic management in high level of competition is growth or even futures. Maybe its usage is in duration level that often as initial aim of activity is mentioned. In a dynamic haven, each company is survived by compatibility with changeful conditions while marled is marling evolution, various types of goods and services must be present. Sometimes market is almost fined and allows that goods continue necessities removal successful persistence. Sometime market is changing quickly, so expectation of being success for a goods is not reasonable, market features of a company for its prosperity may have excessive continuation. Creative ability, quality production and market responsibility promote any particular product. These are competences for survival. A company without attention to market and type of production can act in this way continuously. The fact that organizations and their. Market are nonlinear focuses our attention on changes that occur in those two frequent connections. Instead of imagining change as weaknesses and strengths, opportunity, threats generator can see it as continuous path. This path can be managed by futures and versatility [1]. Chaos theory is used for strategic management, compiling future outlook of organization, prophecies and organization culture. It should be noted, according to our defaults for outside world very different ways for systems management are being utilized. In below figure about static firefighting, there is a default that environment has order and stability. This default shows arson is a threat that must be removed or a problem that must be solved. So management having this default imagines there in not anything for learning from ablaze fire and only must be try to quench fire. On the other hand, in firefighting maker looks the fire as chance for learning. Therefore in this situation quenching fire change to created experiment. During long time, a controlled area facilitates long time strategic planning (strategic management) and saves knowledge for certifying a program effective, inside and outside control. Yet when environment is chaotic and it is considered long term outlook, area cannot controlled and in fact should not be controlled because chaotic borer is first border for learning. If there is not disturbance, any learning is not occurred an as progress in not obtained [1].



In nonlinear and complex systems there is not possibility of system activities exact forecast and planning. Figures and situations appear background of desirable attraction or change effectiveness parameters on system evolutionary process. Managers must become familiar with principles and concepts like self-organizing, learning systems, autonomous groups, enabling, sagacious organizations and metaphors like living organism, brain and hologram that with this paradigm have entered management literature. They must look each creative and experiment as learning chance and encourage organization to learning, experience and experimentation [4]. Whereas complexity of industrial systems dictate strategies needs chaos systems dynamic nature dominates over strategies adjustment. When there is an industrial structure and rivals change their strategies, a company needs clearly to change its guidelines and decision making role. The problem is that no easy way for best strategies conclusion in system does not exist [7]. There is not process for correct recognition of chances and competitive advantage factors and instead of it manager's insight and realization from work area must be relied. This sight is result of their correct recognition from business rules. In strategic thought approach, more than using strategy principles and concepts for developing managers planning skill to developing their views and beliefs renewal are emphasize [13]. Eric Kelmunz during an issue describes business environment in 21 century with features like destroyed changes, transient chances, uncertainty and irregularity. Two factors in causing these conditions had major role; Technology transitions and they globalization like electronic money, digital economy, electronic trade and global communication network muddle business nature continually and make regnant on this arena every day. This technology develops phenomena interaction range and intensifies information flow. Alongside information flow, globalization intensifies goods and capital flow a makes it without borders. Result of this process is increasing number of effective factor on business flow and organization area Chaos [13].



In chaos conditions game rules are changing constantly and for organization any advantage is not except capable of continuous adaptation with the environment. An adaptation with the environment means organization characteristics change for advantage and efficient performance in special environmental conditions. To extent that the environment features are more diverse and its transitions are more excessive, this adaptation become more complex and yet more vital. These positions and their obligations have distinguished the present age from past clearly.

Challenging Changes:

Today business changes are successive and irregular. These changes in various dimensions of political, economic, technological and etc., confront trade and production world with bewilderment and new challenges.

Unrepeatable and Nonlinear Changes:

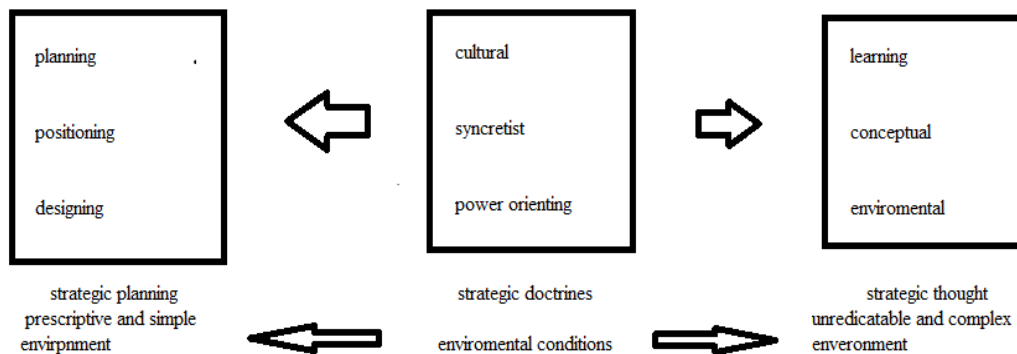
Rang routine increase and displacement speed of information, capital and goods in different dimensions has transformed business nature. One of these dimensions is conversion of market estimable and linear behaviors to complex and nonlinear behaviors. Reason of this matter is increment of effect factors count in market and reciprocal relation between them.

Deadly Competition:

Today we in main market including car, electronic or steel face glut conditions. Glut conditions disarrange competition usual rules and change 'profit and detriment' anxiety to 'existence and inexistence' anxiety. In these conditions everyday numerous companies announcing failure go out from competition normal arena [13].

Strategic Thought, Necessity in Today Conditions:

According to Henry Mintzenberg's doctrine for strategy, to extent that environment is more comprehensible an its changes are more predictable, prescriptive (like strategy planning) and process doctrines tender more effectiveness and performance but becoming complex environment relations and outbreak of nonlinear and leap change (as Today conditions) simple and prescriptive approaches have lost their effectiveness and instead of using descriptive approaches (as strategy thought) is recommended.

*Environment Condition and Strategic Doctrine Relation:*

Strategic planning ideal environment is stable, moderate and apprehensible, while today real environment does not have any of these features [13].

Main Effect of Chaos Theory and Strategic Decision Making:

- 1- In today chaotic and turbulent markets instead of centralization on decision making sort term and flexible situation must be considered.
- 2- Flexible and contingency planning as part of decision making process in investitures must be found more important.
- 3- To creative approaches than reasonable decision making are had more value and importance.
- 4- Creating temporary systems and structures must be had more important.
- 5- Into chaos disorder must be followed regularity [7].

Conclusion:

Chaos theory is a hopeful frame for doing industries dynamic an assessment and complex cooperation between industry factors. With imagining industries as chaotic systems, number of management concept can be developed. Long term forecast for chaotic system is almost impossible and special changes may occur unexpectedly. As a result inflection and adaptive are basic for path continuation. Nevertheless chaotic systems show one degree of discipline that is able to short term forecast as commitment and principal models. Chaos theory also shows importance of developing guidelines and decision making roles for putting in complexity and consultation in preparation of unclear indirect means for access to purposes. Disorder and chaos theory is kind of regular disorder or order in disorder; it is disorder for unpredictable result and regular for having kind of Finality. If this sight (chaos theory) is accepted, our approach about decision making must be changed basically. Traditional default must be abandoned and methods and sights for encountering Chaos world realities must be replaced. Chaos theory forces determiner that chooses a new and quite different authority frame and less confident world requiring high tolerance of ambiguity, high ability for answers and quick and flexible, creative and analytic reactions, is replaced. Chaos theory shows that long term forecast is useless and decisions for long time are imperfect and confounding and it is better to pay attention to forecast and short term decisions and competition advantage will get from having best short term forecast. As a result a unique strategy and collection of methods are not enough. For matching with unreliability, codification of total collection of programs and different positions is necessary. Organizations need to order. Some of orders result from strategies and structures. Strategy is for giving direction and structure is for specifying responsibilities. Howbeit, managers search way for imposing this order in disorder way because when organization continues its way, some outside force change inevitably and new technology are appeared. It is obligatory that organizations will have culture based on fundamental and new forecasts of chaos theory. Instead of valorizing compatibility, creative digression must be valued. Future outlook that is a position of long term desirable future during facing with current issues

of conformity with challenges of a turbulent external environment must be fixed in second place of importance. In addition reviewed above, strategic thought is suitable approach for creating strategy in today business environment. This approach in intense competitive conditions where market behavior is unpredictable is no replacement advantage.

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