

The Monograph of Greece: Exploring Complex Adaptive Leadership in a European country.

Evangelos Ergen, ergen@ergen.gr

<http://www.ergen.gr>

Issue date: 03 February 2012

Abstract: This paper is an attempt to bring forth the notions of chaos, complexity and leadership, analyse their interrelation and discuss their impact on the business sector of a country. Furthermore, it aims to correlate this relation with the emerging issue of resilience and to explore the complex adaptive leadership framework. Times of crisis, have demonstrated that scientific thinking changes from deterministic certainty to non-deterministic uncertainty. On the other hand, managerial practices proved to be complexity-dependent, while emergent leadership and governance demands may appear inconsistent with prevailing regulatory wisdom.

The study accommodates literature review based on the research question: how the exploration of complex adaptive leadership could reveal new managerial practices that would help a country and its business sector to overcome survival issues, and turn weaknesses into opportunities, demonstrating *resilient-orientated governance*.

There are discussed various findings on chaos theory, complexity science and leadership. Moreover aspects on followership, communities of practice, and “panarchy”, are presented. In addition, the present study approaches the analysis in a way that simulates the current case of crisis in Greece and tries to explain the relation of complex adaptive leadership with what the country and its business sector is currently experiencing.

A special concern on leadership is given. It is analysed as a dynamic phenomenon that defines a society's resilience and survival.

The integration of these three components (*chaos, complexity, leadership*) characterises the behaviour of a society which may confront successfully or not challenges and threats. Technology has contributed to the emergence of knowledge era. Decisions have to be taken where the knowledge resides and this is the new challenge for any social entity to realise its own strengths and shift leadership from the industrial age to the knowledge era. As it seems it is rather difficult to compete the future with past practices.

The system of thinking and acting has changed and organisations as prime cells demonstrate informal emergent dynamics towards learning, innovation and resilience. Complex adaptive leadership leads to more of an *enabling leadership style* which tries to integrate complex adaptive emergent forces in a society, rather than use the top-down position and power approach. Such emergent leadership style is based on interactive dynamics stemming from differences in preferences. Informality and enablement are replacing formality and control.

The leadership model of “panarchy” could be considered as an alternative governance strategy to confront with knowledge era. Regionalism supports such choices. Nevertheless, social concern and cohesion should not be disregarded. Not to forget that underneath complexity simple rules are operating.

Modern problems should be confronted with modern techniques even these encrypt unknown paths. In other words, this is the common characteristic between complex adaptive leadership and resilience.

Keywords: chaos, complexity, leadership, complex adaptive leadership, resilience

1. INTRODUCTION

The world of global managers has recently recognised complexity, as the new primary challenge for businesses. The research took place on 2010, and was addressed to more than 1,500 CEOs of the “what-so-called” top global companies (*Palmisano IBM, 2010*). The understanding and successful integration of complex adaptive systems, is actually what is necessary to cope with emergent dynamics.

This paper develops a discussion starting from chaos as a concept. It gives various meanings and identifies relations with society and organisations. Mankind is synonymous to chaos since human awareness is increasing. Technology as a component of chaos fastens this race characteristic and contributes rather rapidly to the compliance of the race's aim, which is progress and prosperity.

In section 2, except the discussion on chaos, there is an attempt to correlate chaos with complexity and complex systems. Complexity is presented through the study of complex systems' characteristics and there is a parallelism to managerial practises. In periods of flux, complexity deals with leadership models, probably more than any other occasion. Therefore, leadership is discussed under the prism of complexity and various views are presented. Among them special consideration is given in the relation between leadership and followership. Although, followership is not new as a notion, it is the relation with leadership that changed through time and the framework within which they interact. Any emerging model of leadership is expected to incorporate or stem from followership, as followers seem to play a crucial role in current times.

Trying to understand a social entity (country, region, and organisation) as an emergent complex adaptive system (CAS), in the last part of section 2, there is an effort to discuss and identify characteristics of leadership and what is the impact on such entities. Focus is mostly regional orientated and aspects are approached from that perspective. Certain managerial practices are presented and there is an attempt to approach in a simplistic way, as possible, the essence of leadership in such systems.

In section 3, is given the research question, actually, the description of the case study. Literature review performed in section 2, has been done in the framework of presenting ideas and discussing aspects in the effort to cultivate critical thinking, aspects' synthesis and possibly concept's renewal.

Section 4 provides thoughts and recommendations, trying to integrate literature review to research question (case study).

Conclusions are mostly deal with future aspects and possible further discussion on new research questions that rise for current study.

2. Literature Review (the theoretical part)

2.1 Chaos

The term chaos usually brings forth notions of turbulence and disorder which in continuous raise the sense of avoidance, risk and uncertainty. It sometimes appears as synonymous to catastrophe or abyss. According to *Psychogios (2011)*, chaos is the irregular, unpredictable behaviour of deterministic, non-linear dynamical systems. Similarly, *Filipe et al (2010)* agrees that chaos occur in deterministic, non-linear and dynamical systems. Therefore, the major-identified component of chaos is the powerful dynamics that reside in it and their potential unpredicted reaction. These dynamics are the derivative of the existence of an enormous number of interactions and interrelations. The manipulation of such dynamics either directed or accidental, enables the so-called "catalytic mechanisms"; these are subsystems where small changes could bring asymmetrically large results. It is challenging what *Obolensky (2007)* claimed, that it is preferable to use chaos instead of avoiding it. In the same way, *Burgelman and Grove (2007)* identified that managing strategic dynamics is the challenge of embracing chaos. Aspects of chaos are shown up everywhere in the world, and chaos theory has affected in various ways other sciences in terms of studying the chaotic systems, especially the way they operate (*Filipe et al, 2010*). Recent studies though in dynamical systems theories, revealed that chaotic systems still appear to have internal cohesion factors which regulate and reinforce self-organising systems. This is due to core characteristics of inherent complexity which resides in chaotic systems (*Filipe et al, 2010*).

From time to time organisation theorists borrow ideas and insights from the natural sciences in an attempt to resolve the messiness of the organisational world (*Burnes, 2005*). Various researchers (*Hassink, 2010; Simmie and Martin, 2010; Clark et al, 2010*) in recent studies, have adopted the mindset of natural systems, most of the times trying to realise or introduce evolutionary thoughts such as complex systems and resilience. A social entity could be simulated as a natural system which incorporates different sub-entities with powers, business links and social concern. At this point, it is considered as a social system which may be characterised by consensus or disagreement, cohesion or decay. Moreover, it could be seen as a manifestation of human actions and social relations- an approach that introduces the idea of transition through time, space and process. This framework defines the entity's chaos which demonstrates its specialties and

diversifications. Organisations, regions and countries has yet much to learn from ecology and nature.

Nevertheless, in chaos except dynamics there is nonlinearity (*Puente, 2006*). This is a possible cause of failure for many organisations unless they learn to cope with it. Linearity corresponds to stable structures which in extent and especially in management framework predefine the outcome of business strategies as well as business targets. Stability provides predictability. On the contrary, nonlinearity demonstrates bifurcations which can create turbulence and divisive traits. Therefore, it recalls uncertainty, sense of survival, adaptation and the emerging notion of resilience. Resilience relates to exogenous shocks and reflects the organisation's (or country's) capacity to absorb disturbance and reorganise while undergoing change, so as to still retain essentially the same function structure and feedbacks (*Bristow, 2010*). There is a difference though with adaptability in terms of the degree of change that should be taken. Adaptability encompasses incremental changes and alterations for an entity, while trying to align with new norms and codes. Resilience incorporates more "to the bones", radical changes, which usually implies the ultimate change of structures. It is directly linked to equilibrium of a country or an organisation and prepares this entity for transitional changes until the new state. In times of crisis, mankind need to confront with sudden changes which jeopardise structures and alter behaviours.

Burgelman and Grove (2007), introduced that adaptation at the edge of chaos is necessary for an organisation to survive. According to them, adaptation could be achieved through the implementation of induced and autonomous processes towards the strategy making process. Additionally, other researchers (*Hassink, 2010; Christopherson et al, 2010*) claimed that diversity and specialisation are vital characteristics for a company which fights for survival. Chaos is linked to resilience especially when referring to an organisation since this concept is the only way to cope with undefined occasions or sudden changes.

Chaos theory and complexity science remain interrelated in the ground of incorporating the notions of dynamics and dynamic systems, and how these affect leadership in organisational and regional evolution.

2.2 Complexity (and Complex Systems)

According to *Burnes (2005)* chaos or disequilibrium is a necessary condition for the growth of dynamic systems. Chaos occurs when a system is very sensitive to the initial conditions rules (*Psychogios, 2011; Filipe et al, 2010*). *Puente (2006)* defined this as the "foliage of chaos". The phenomena derived from the presence and operations of dynamic systems reflect a very complex reality.

Complex in simple terms is something that it is not realised or solved. A complex system is a system that as a whole appears to have certain behaviour and attributes which do not necessarily exist in its parts. *Batty and Torrens (2001)* defined as a complex system, an entity which is coherent in some recognizable way but whose elements, interactions and dynamics generate structures, admitting surprise and novelty which cannot be defined a priori. Therefore, a complex system is more than the sum of its parts since it accommodates numerous interactions, dynamics and behaviours inside. Any part, cannot replace the whole. *Schneider and Somers (2006)* have included in their study an interesting table comparing the properties of open and complex systems (*Appendix A*), trying to discuss the issues of organisational change and identity under the prism of leadership. They defined complex systems as poised systems that function at the edge of chaos.

More attributes which were identified in complex systems, earlier in research, are the following (*Batty and Torrens, 2001*):

- Complex systems have extensiveness in their elements or objects that make any fixed description incomplete;
- they generate a dynamic which enables their elements to transform in ways that are surprising through adaptation, mutation, transformation etc.;
- they have the potential for generating new behaviours;
- they demonstrate non-linear processes which amplify the hidden heterogeneity;

The same authors (*Batty and Torrens, 2001*) highlighted wisely, that a complex system is one that can respond in more than one ways to its environment, revealing the mutual relationship between the systems and their environments. This statement incorporates the elements of extensiveness, process and surprise. Moreover, it aligns with emergence, differentiation and path dependence, as it was raised later in 2006, by *Schneider and Somers (2006)*.

At this point, such elements may be parallelised with managerial processes especially with organisational change and leadership practices. Understanding complexity seems close to managing change, managing crisis situations and realising the structures of a living entity. In an extent this is useful to realise the complex system of a country as a whole, especially when this experiences a time of recession and economic shock.

Complexity incorporates dynamical systems which among others need to follow a minimum of rules to survive. The major target is that a system, or a country in our case, needs to develop a set of rules which will keep it alive and operating. This is the principle of order-generating rules. Every living entity needs a set of order-generating rules to survive in complexity. Complex systems are entities which consist of smaller agents/entities/parts that interact with each other and demonstrate certain behaviours according to their external affects. Such affects are result of patterns of relationship and interconnections among the agents-participants. Usually there are no clear boundaries in complex systems since these are under constant change. Dynamics that are developed are uneven and no entity can control the whole system as it cannot capture its whole dimension. Nevertheless, the rule of micro-diversity exists, meaning that small sub-entities form small sub-groups within the system, and develop certain behaviours and interconnections activating a local mindset. As a result there is discretion in agents in regards with whom they will interact.

Another perspective is to realise that a system in order to operate needs energy and interaction with its environment. Thus, internal and external interrelations exist simultaneously. It is worth to mention that a complex system may choose to close its connection with the environment. This can happen when the system decides to renew itself and acquire a balanced state. This state may be a result of the time interval over which the dynamics of the system are captured; a restart process or a start from a specific point process. Nevertheless, it is difficult for complex systems to close their interaction with external affections. Raising barriers to external influences will temporarily protect and guarantee steadiness, but systems cannot remain isolated from their environments for along time.

It is possible that such interconnectivity and interaction alter the structures of the complex system when emerging catalytic mechanisms force the system to a new self-organising and self-regulating practice. Agents are experiencing the co-evolution process within the system which increases the complexity degree but creates new perspectives for development.

Traditional managerial techniques are focused to a paternalistic model where the authority stems from the organisational chart which defines the administrative top-down way. It may be wiser to approach organisations -and countries in a broader term- as complex systems trying to realise the new dynamics that emerge and their role in the total system. At the heart of these dynamics are (a) humans, (b) technology, and (c) knowledge. Human beings experiment, innovate and have a constant curiosity to observe and explain. They tend to create chaos. Technology is the mean between humans and knowledge. It is the tool to realise, expand, experiment and challenge. Technology is contributing to growing complexity and the last decade is the one of the most unpredicted external forces for an organisation in terms of its impact (*Palmisano IBM, 2010*). Specifically, the materialisation of information into knowledge creation, through the use of technology, has cultivated new dynamics of quality and power (*Janecka, 2008*).

On the other hand, knowledge is the new capital of global society. As *Elliott (2009)* asserted, knowledge transfer and assimilation is a key component for the learning framework in an organisation. The knowledge acquisition and how this could be exploited develops new norms and business practices.

Nevertheless, according to *Palmisano (2010)*, the rapid escalation of complexity is the next biggest challenge for managers and leaders in global terms. The interactions of people in organisations could be identified as analogous to a complex adaptive system (*Dalmau and Tideman, 2011*). For example the disconnection between the formal organisational system and the hidden informal network of relationships, if exists, demonstrates different behaviours not only in an organisation but in a country as well. Stating far from agreement keeps far from certainty. Moreover such states enable complex responsive processes. An intriguing model has been found and given in *Appendix B* of this paper, which provides nine points of inquiry as a compass for managers to cope with complexity. This planning framework, known as “the process enneagram” is a diagnostic tool which supports an organisation to confront with situations related to business planning, leadership, change, sustainability, relationships and so on (*Dalmau and Tideman, 2011; Knowles, 2001*).

Uhl-Bien et al (2007) linked complexity with leadership. They argued that complexity provides the framework to develop leadership perspectives that comply with modern needs especially with the dynamics that emerge in an entity.

2.3 Leadership

The knowledge era imposes new leadership characteristics. As *Uhl-Bien et al (2007)* highlighted the leadership models that adopted in the last century were mostly adapted to bureaucratic-administrative paradigms. Consequently, they were not well-fitted to knowledge-oriented economies. Nevertheless, such models still remain popular in organisations and countries. Of course leadership styles impose issues of politics and governance and this incorporates social concern.

Likewise, *Lichtenstein et al (2006)* identified that traditional hierarchical views of leadership proved to be less useful given the current complexities. Emerging technologies have cultivated a framework of knowledge, learning and wisdom which is diffused to every single follower of a system (e.g. gained access to every citizen of a country). This catalytic mechanism has changed social structures. People, as users have access to capitalised information and communication, which enables them to form communities and share practices. Modern communities, demonstrate their own attributes in terms of scope, identity, aims, rules and regulations. This is their common practice. As a result, this collective intelligence becomes the new capital which boosts dynamics and ingrains behaviours.

The new leadership paradigm should take into consideration the new parameters and trends. An interesting model given below (*Figure 1*), demonstrates the pathway of ideas and dynamics within a complex system and how these are developed within a society.

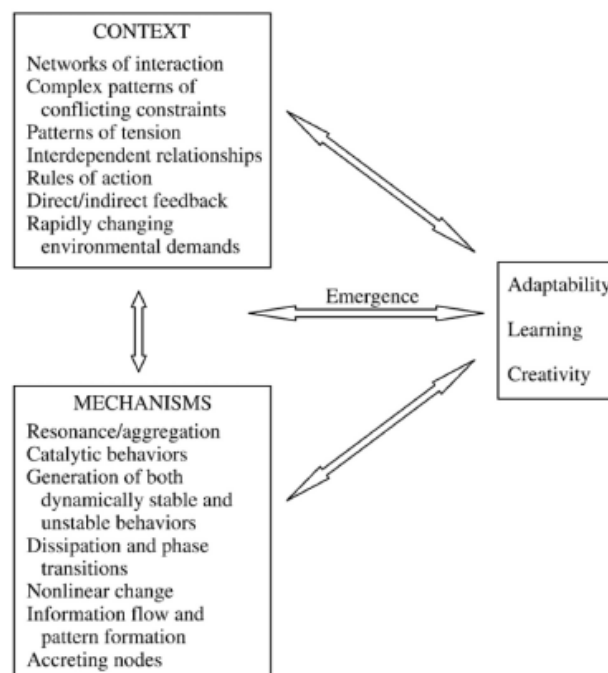


Figure 1. The emergence dynamic.

(Source: Uhl-Bien, Mary et al (2007) Complexity Leadership Theory: Shifting leadership from the industrial age to the knowledge era. *Journal of the Leadership Quarterly*, 18(4), p. 308.)

In a complex system, ideas and actions emerge from an interaction between mechanisms and contexts. In continuous, their emergence enables adaptability, creativity and learning. This scheme activates the innovation to organisation interface creating a system dynamic flow. Such flow may be informal and is defined by the nature of system dynamics. Moreover this flow may be nonlinear.

A complex system, which accommodates diversified dynamics, is composed by different players who demonstrate certain behaviours and form micro-groups. In a chaotic system these players could be defined as followers who know and support the system. They compose the knowledge

capital and they are the backbone of the system. They form followership. There is no much researched on followership; at least, not so many discussions as in the case of leadership.

Nevertheless, followership as a pattern is not recent. *Litzinger and Schaefer (1982)* have presented a study in 1982, claimed that leadership may be an achievement of followers. They have concluded that able leaders may emerge only from the ranks of able followers. Leaders should first undertake the responsibility to service their people, demonstrating their ability to obey (see *characteristics of leaders and followers in Appendix C*). This is the experience of servitude where paradoxically a leader learns how to be a follower first. There is an intriguing thought which compares followership with management by objectives (*Litzinger and Schaefer, 1982*). Similar to MBO, which is a shared practice, leadership and followership are based on shared efforts towards targets. In both cases all parts are evaluated and there are certain measures.

On the other hand both practices have an additional common characteristic. There is a motivation-rewarding scheme which exists. This stands in a framework within the traditional hierarchy and the work-to-achieve standards, usually through the alignment of people to the organisation's strategic plan.

Kirchhubel (2010) approaches followership as an upwards managerial style rather than as a social pattern which encrypts social characteristics. The author restricts the scope to routine job activities and study on how these could be perceived under the prism of followership. Although this highlights mostly technical issues there is a significant contributing thought; it reveals the notion of "leading from the middle" asserting that people who stand close to the daily operations of a company, know better its strengths and weaknesses. Concurrently, middle level managers have the power to enable behaviours because of their access to resources and their involvement and close responsibility of the system (*Uhl-Bien et al, 2007*). This reminds more of the contradiction between high and middle level management in a company and brings forth the issue of managerial gap; the distance between the two opposite levels in the hierarchical pyramid and the things that upper management never know.

Either through followers or middle managers, leadership is under scrutiny. As *Minas (2005)* asserted, there is a certain zone of complexity which activates a series of leadership changes, when an organisation or society finds itself within its limits. Daring to borrow an analysis from the human mental health system -which is a complex adaptive system (CAS) - this contributes to the understanding of how we could perceive the leadership for change (*Figure 2*).

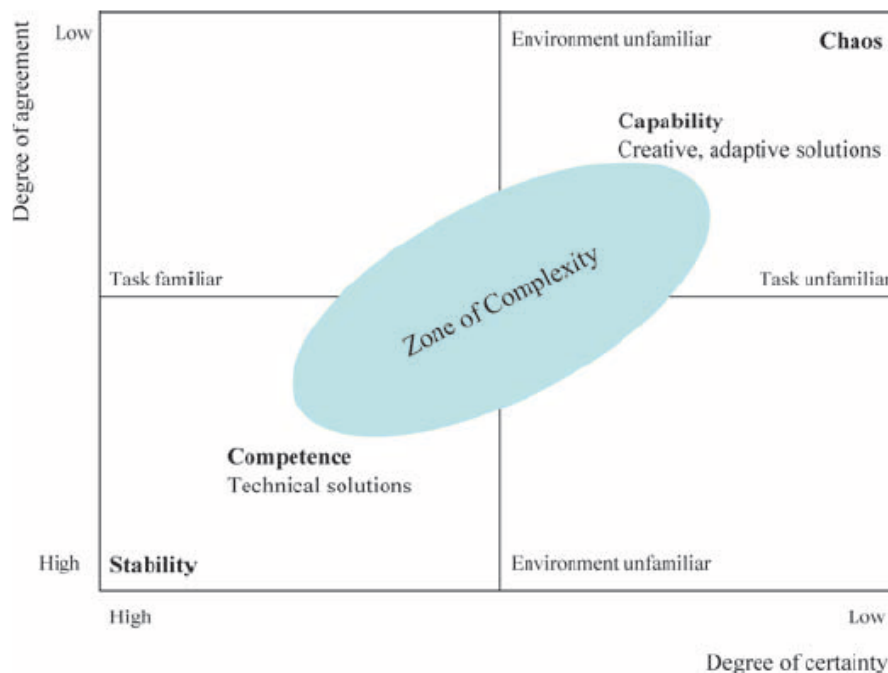


Figure 2. Zone of complexity: transition between stability and chaos.
 (Source: Minas, Harry (2005) Leadership for change in complex systems.
Journal of Australasian Psychiatry: Leadership & Management, 13(1), p. 36.)

This model explains that when uncertain circumstances occur in an environment that becomes unfamiliar, there is a need for capabilities that generate creative solutions to new and emerging problems. A mental health system as a complex adaptive, non linear dynamical system, demonstrates such phases. In the same manner, leadership could borrow elements from similar systems, inspired from nature.

Dalmau and Tideman (2011) have recently introduced a similar, simpler though model, trying to correlate certainty with agreement (*Figure 3*) from the managerial perspective.

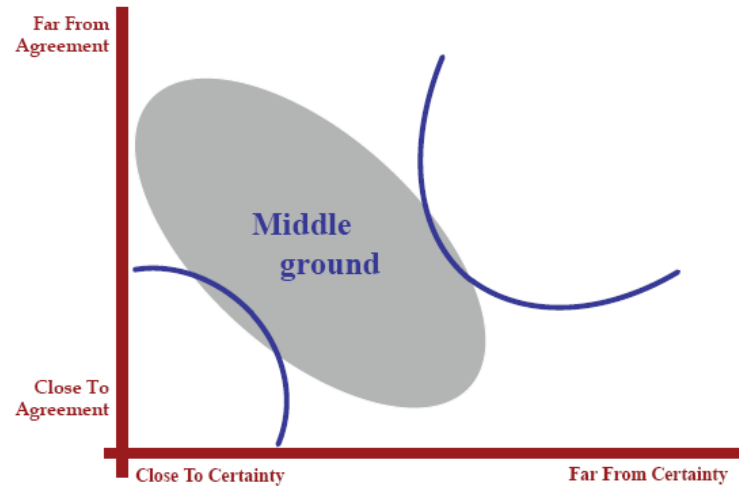


Figure 3. Problem types that the managers face

(Source: Dalmau, Tim and Tideman, Jill (2011) *The Middle Ground: Embracing Complexity in the Real World*. *Journal of Journal of Emergence: Complexity and Organisation*, 13(1-2), p. 73.)

Managers and leaders, operating in an environment of stability were used to face problems within the “middle ground”, thus, it was needed to take linear, top-down decisions. When, problems tend to fall outside this ground, to the upper right corner, then managers need to confront with reasonable levels of uncertainty both internally and externally. Little agreement and little certainty plus hidden informal social networks usually reveals lack of appropriate style of leadership.

Trying to administer this in the traditional command-control way will possibly fail. It is preferable a study on its qualities and patterns as well as the understanding of its dynamical behaviours. Competence is not enough. On the contrary, there must be a leadership system which will enable and integrate the internal powers. A number of researchers so far have discussed the issues of administrative and adaptive leadership (*Uhl-Bien et al, 2007; Lichtenstein et al, 2006*) as models to cope with complexity.

In transitional stages though, such as times of crisis, or external shocks, there is the issue of cohesion. Leadership style, could consider that decay is close to entropy. On the other hand, unleash of powers towards survival may jeopardise issues of social concern and solidarity.

2.4 Complex Adaptive Leadership and Panarchy (the linkage to resilience)

According to *Simmie and Martin (2010)*, economies are based on and driven by, knowledge. Knowledge is never static but constantly changes. Therefore, the search of any equilibrium in an organisation is an on-going process. Living in the knowledge era which succeeded the industrial age, have started to impose alterations in structures of living entities. This necessitates changes in leadership attitudes and practices, as already discussed in the previous section.

We could recall what Schumpeter introduced as creative destruction, approaching it from the leadership style perspective, adopting it as a practice to confront with sudden external shocks which affect an organisation. But operating in an environment which deals with the evolutionary dynamics of complex adaptive systems, this implies the existence of a corresponded complex adaptive leadership mentality.

A self-regulatory environment seemed to gather many advantages but the issue is, if followed, who will undertake the complex thinking. Which group will engage in the complex information processing (*Janoff-Bulman, 2009*).

Complex adaptive systems (CAS) are self-organised systems which have the ability to adapt to any external affection including their radical change of inner structures, if necessary. *Scott (2008)* raised the issue of cooperative behaviours which could exist among the agents of a CAS. This is necessary to progress, if the system prefers to survive. Therefore, although a CAS demonstrates different dynamics and norms within its own substance, there must be some simple rules to survive.

The panarchy model is a governance (resilient-orientated) style which allows the coexistence of resilience, adaptation and dynamic systems based on diversity. Moreover it can support the integration of the intelligence capital accumulation of an organisation or country, and help it to sustain especially when crisis situations are experienced. An intriguing aspect by *Hartzog (2009)* claims that:

Complexity + Networks + Connectivity => Panarchy

The same author highlights that technology has an enormous power to engage people in achieving unimagined activities which in result directs to wider social and economic transformations. Technology is not simply a mean for achievement. It is a core factor for radical changes. Thus, technology and knowledge brings to an organisation new intelligence capital that leverages benefits and extra power. This situation unavoidably brings forth new agents/players who according to their learning capacity create spheres of governance. Such a complex system in an organisation needs to be managed in a more sophisticated way. Since diversity is considered an asset for a region (*Pike et al, 2010; Christopherson et al, 2010*) it would be a challenge for a manager to accommodate diversified dynamics in the organisation trying to agglomerate their outcome for achieving innovation and sustainability. This practice could be shared among same norms and goals in companies while in an extent this could be adopted on a country level.

Likewise, *Haldane and Bond (2004)* have tried to combine complexity and organisations through the study of Communities of Practice (CoPs). They have tried to analyse it as a leadership path. CoPs are formed groups which have less structural integrity, and its members share common practices and targets. Moreover, they do not have clear hierarchies. Nevertheless, if the community operates in a chaotic situation it demonstrates strong linkages among its members and cultivates a sense of self-regulation and self-resilience.

According to *Hartzog (2009)*, panarchy is a governance system of highly interconnected systems (complex adaptive systems) which relies on diversity and resists hierarchy in order to function and adapt. Nevertheless, this system follows certain rules of cooperation, legitimacy and authority developed among these overlapping dynamic networks which comprise the system. Decentralisation is followed by omit of hierarchy.

It was recognised that any leadership model should incorporate the pathway to coherence. The “process enneagram” which was discussed in previous sections is recommended by *Knowles (2001)* as an organisation map for self-organising leadership (*Appendix D*). The nine principles create a leadership pattern which enables cohesion and organisation change in support to the formal operational and strategic leadership patterns.

Another perspective is the eight principles of Complex Adaptive Leadership (CAL) which introduce a simpler confrontation with complexity (*Psychogios, 2011*) (*see Appendix E*). This deals with managers that should place simple rules, specific boundaries, concrete targets, and have tolerance to mistake.

3. Case study description

Times of crisis reveal weaknesses and bring forth path-dependence outcomes, which till the last moment were camouflaged under wishful thinking. On the other side, these are challenging times of reconsidering and repositioning new dynamics that were so far kept aside as unsuccessful. The triangle of (a) fear, (b) greed (c) fake hope and the relation of a society with this analogy, proclaim that years of prosperity can easily replaced by years of poverty and recession.

Greece is currently experiencing an economic turbulence which starts to affect the social cohesion of the country and this incrementally turns to entropy. Organisations as vital cells of the country suffer a reality of uncertainty, lack of supportive environment, poor political reactions and total unwillingness for change. Moreover, the norms of chaos and complexity are overlooked. Managers are obliged to operate in blindness with less information and minimum resources.

This study aims to integrate the findings from literature review that were presented in the previous section and provide some thoughts from the managerial perspective both in organisational and country level.

4. Idealism and Realism (Proposal)

Paul Krugman's assertion is noteworthy; regions initially develop, grow and prosper owing to particular path-dependent processes (*Bristow, 2010*). Path-dependence is a notion associated with not only humans but also organisations along with regions, originating from their decisions' total throughout time. *Hassink (2010)* highlighted that a path-dependent process grows out of a system's history as well.

Path-dependence is the result of an entity's behaviour towards the norms of chaos and complexity. In complex systems small groups can cause big effects. The shift from industrial age to knowledge era with the help of technology raised huge impact in social entities and their structures. Humans still have much to learn from nature.

Greece has yet to change its path-dependence on previous false policies and wrong assumptions, fake hopes and fears. Dilemmas and choices no matter where they are sourced from could be amalgamated with regional knowledge while local managerial powers could be unleashed towards entrepreneurialism and innovation.

Decisions have to be made where the knowledge resides. Since this part of the global community experiences path-dependence problems, the adoption of new leadership patterns could activate hidden dynamics.

First of all the ingrain of regionalism in combination with creativity and innovation as core components of resilience could be infused in the new leadership style stem from informality and panarchy. Concerns presented as problems could be confronted as core processes and local human intelligence capital could be engaged to prioritise them in a co-creation approach.

This imposes the need for changing the structures in a way to unleash the powers that demonstrate dexterity to change. Times of crisis jeopardise elites and threaten status quo.

The new leaders need to push and follow rather than pull and lead. Complexity can be confronted with creativity, diversity and change of communication channels.

The change of governance rules and the prioritisation of localisation for survival may be another aspect for consideration. Moreover, the commitment to upset the elite and the given status quo challenging their plans with successful informal practices that stem from followership such as social networking, living labs, communities of practice etc.

The new governance model, respecting the complex adaptive leadership framework, could focus on people skills and knowledge in order to acquire insight and intelligence. This cannot be achieved unless trust is cultivated. The aim is primarily the social concern and not the increase on profits. Resilience in a complex system implies survival through time getting the experience and exploiting the opportunities emerged for future endeavours. Growth, at this point, means staying alive in the system.

This enables a challenge in current business models with the redesign of core activities in a way that confronts with resilient practices and improves future perspectives in terms of global standing. In addition, this implies organisational change which could be based on viral communication.

Unfortunately, old powers that have proved to be effective in a sense, but ineffective throughout time, preferably should left behind and new replacements should be raised starting from the players that orchestrate the dynamics of knowledge.

There is a doubt of following a model where regional governance will function independently or in parallel, if possible, to the state governance. State should unleash local powers and let regional dynamic systems operate in a self-organising mode following the panarchy model. Nevertheless, state could participate in this new governance style as a player who will decentralise itself and maintain a legitimate role. In the same manner a leader in an organisation could activate the followers/employees based on their diversification and enable them to provide new knowledge and acquire new strengths. Moreover this will reveal new behaviours which in an extent could create norms and progress paths.

There is to realise that hierarchical powers are weakened and new types of power appear which mostly stem from group relationships. This still reveals the inexistence of modern leadership styles which will determine the change period that we currently live. At least, until this happens, each organisation and each country should follow a model which will enrich its strengths and cultivate resilient knowledge based autonomy.

Obviously the shift from hierarchy to panarchy is not easy, but when survival is the issue all scenarios could be equally scrutinised and past biases are suggested to remain behind.

5. Conclusions

Dynamical systems theory and non-linear dynamics seem to bypass past successful managerial theories and obviously embed a new framework for social entities to be led. Although mankind has managed to understand non-linearity, and has studied chaos theory and complexity science, much yet left to learn.

It is identified that simplicity has been replaced by complexity. The era of absolutism which had provided so far some protective mechanisms, was surpassed by uncertainty which in return changed the focus from prediction to understanding.

The essence of equilibrium is jeopardised while the new permanent state tends to be “far-from-equilibrium”. Nevertheless, as discussed earlier, even complexity operates under simple rules meaning that there is always space for a set of standard rules to use as a compass. It is the mission of new leadership to recognise the optimal case, in a complex system, where the equilibrium comes. Probably this is the state when the different players will have no other motives to change their behaviour. Sometimes the search of equilibrium itself may not be the point of reference; instead the point may be the emerging obstacles. In an extent, the complex system as an entity is the equilibrium and the leadership style will always be the point for further exploration. Leadership could be seen as a complex interplay between participants instead of position and authority.

The adoption of different leadership mindset, as concluded in this study, need to be based in a broaden framework of governance. In opposite case, any complex system may end to diminish of its social attitude and self destruction. Thoughts and findings that are presented in this paper deal with complex adaptive leadership in terms of unleashing powers and dynamics. This mostly deals with how different players could be integrated, coordinated and exploit their produced capital towards resilience. Leadership is expected to focus on social cohesion and concern.

The panarchy model discussed provides the framework for a cooperation tag among the participants in a complex system. It is a model which can cultivate a cooperation paradigm where diversification of players transforms to a meliorist-oriented community. Connectedness is not to be overcome. Moreover, this model capitalises on complexity through collective intelligence. It mobilises human capital towards flexibility, creativity and speed.

But this model, solely, cannot fill the leadership gap. It can support the release, it can provide the conditions, but there is a need for this specific component of the complex system which will operate as the “magic bullet” for the change (Bond, 2003). This artefact could be the followers or the new subgroups already reside in the system, not necessarily human actors but non-human as well. Simple managerial practices are not expected to work unless such a framework will be placed on top. This is a challenge on how humankind will be able to find a way in using science in society.

REFERENCES

- Batty, Michael and Torrens, M. Paul (2001) Modeling Complexity: The limits to prediction. *Centre for Advanced Spatial Analysis, Working Paper 36*, UCL, p. 1-36.
- Bond, Peter (2003) The Biology of the Technology of the “Magic Bullet”: From BPR to Objects of Art. *Working Paper: Organisational Symbolism and Organisational Wellness*, Cambridge July 2003.
- Bristow, Gillian (2010) Resilient regions: re-“place”ing regional competitiveness. *Cambridge Journal of Regions, Economy and Society*, 3, p. 153-167.
- Burgelman, A. Robert and Grove, S. Andrew (2007) Let Chaos Reign, then Reign in Chaos – Repeatedly: Managing Strategic Dynamics for Corporate Longevity. *Strategic Management Journal*, 28, p. 965-979.
- Burnes, Bernard (2005) Complexity theories and organizational change. *International Journal of Management Reviews*, 7(2), p. 73-90.

- Cavell, P. David (2007) Leadership of Followership: one or both? *Journal of Healthcare Financial Management*, November 2007, p. 142-144.
- Christopherson, Susan et al (2010) Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society*, 3, p. 3-10.
- Dalmau, Tim and Tideman, Jill (2011) The Middle Ground: Embracing Complexity in the Real World. *Journal of Emergence: Complexity and Organisation*, 13(1-2), p. 71-95.
- Elliott, Dominic (2009) The Failure of Organizational Learning from Crisis – A matter of life and death? *Journal of Contingencies and Crisis Management*, 17(3), p. 157-168.
- Filipe, Jose Antonio et al (2010) Managing Complexity: A problem of chaos in fisheries policy. *Journal of China-USA Business Review*, 9(3-81), p. 15-23.
- Haldane, Andrew and Bond, Peter (2004) The Use of KALiF in the Development of Complex, Emotioning, Innovating, and Polytechnical Communities. *Learning Futures: Knowledge Board*, October 2004, p. 1-21.
- Hartzog, B. Paul (2009) Panarchy: Governance in the Network Age. Available at: <http://www.panarchy.com/Members/PaulBHartzog/Papers/> (accessed on 20 December 2011).
- Hassink, Robert (2010) Regional Resilience: a promising concept to explain differences in regional economic adaptability? *Cambridge Journal of Regions, Economy and Society*, 3, p. 45-58.
- Janecka, P. Ivo (2008) A Review of Managing Information in Complex Organisations: Semiotics and Signals, Complexity and Chaos. *Journal of Emergence: Complexity and Organisation*, 10(1), p. 91-95.
- Jannof-Bulman, Ronnie (2009) Political Attitudes and Complexity: Responses from a Motivational Perspective. *Journal of Psychological Inquiry*, 20, p. 177-182.
- Kirchhubel, Daniela (2010) Effective Followership: How to manage upwards. *British Journal of Administrative Management*, Autumn 2010, p. 18.
- Knowles, N. Richard (2001) Self-Organising Leadership: A way of seeing what is happening in organisations and a pathway to coherence. *Journal of Emergence*, 3(4), p.112-127.
- Lichtenstein, B. Benyamin et al (2006) Complexity Leadership Theory: An interactive perspective on loading in complex adaptive systems. *Journal of Emergence: Complexity and Organisation*, 8(4), p. 2-12.
- Litzinger, William and Schaefer, Thomas (1982) Leadership through Followership, *Journal of Business Horizons*, September-October 1982, p. 78-81.
- Minas, Harry (2005) Leadership for change in complex systems. *Journal of Australasian Psychiatry: Leadership & Management*, 13(1), p. 33-39.
- Obolensky, Nick (2007) Chaos Leadership and Polyarchy – Countering Leadership Stress? *University of Exeter: Extended Essay Series*, Center for Leadership Studies, p. 1-17.
- Obolensky, N. (2010) *Complex Adaptive Leadership: Embracing Paradox & Uncertainty*. Gower Publications.
- Palmisano, J. Samuel (2010) IBM Report: Capitalising on Complexity, Insights from the Global Chief Executive Officer Study. *IBM Institute for Business Value*, p. 1-71.
- Psychogios, Alexandros (2011) Leading and Managing People: Complex Adaptive Leadership. *Academic module material of the MBA course*, CITY College International Faculty of the University of Sheffield, November 2011.
- Puente, E. Carlos (2006) More lessons from Complexity – The origin: The root of peace. *Journal of Emergence: Complexity and Organisation*, 8(3), p. 115-122.
- Schneider, Marguerite and Somers, Mark (2006) Organizations as complex adaptive systems: Implications of Complexity Theory for Leadership Research. *Journal of The Leadership Quarterly*, 17, p. 351-365.
- Scott, Jr. J. Ronald (2008) International Development in a Complex Adaptive System. *Journal of Public Administration Quarterly*, Fall 2008, p. 339-366.
- Simmie, James and Martin, Ron (2010) The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3, p. 27-43.
- Uhl-Bien, Mary et al (2007) Complexity Leadership Theory: Shifting Leadership from the industrial age to the knowledge era. *Journal of The Leadership Quarterly*, 18(4), p. 298-318.

BIBLIOGRAPHY

- Dal Fiore, Filippo (2010) Is Complexity Revealed By A Mutual Capacity To Blackmail? The Search For Geopolitical Equilibrium And The War On Terror. *Journal of Emergence: Complexity and Organisation*, 12(4), p. 138-142.

- Hall, Andy and Clark, Norman (2010) What do complex adaptive systems look like and what are the implications for innovation policy. *Journal of International Development*, 22, p. 308-324.
- Keren, Michael (2009) China and India: A note on the influence of hierarchy vs polyarchy on economic growth. *The European Journal of Comparative Economics*, 6(2), p. 325-346.
- Kioukias, Dimitris (2004) *In the Societies of Risk: Unseen issues in the globalised social Europe*. Papazisis Publications, Athens (original book in Greek).
- Longman, Phillip (2006) The Return of Patriarchy, *The Washington Post: Foreign Policy*, 17 February 2006, http://www.foreignpolicy.com/articles/2006/02/17/the_return_of_patriarchy?print=yes&hid (accessed on 02 March 2010).
- Lundin, C. Stephen and Lancaster, C. Lynne (1990) Beyond Leadership...the importance of Followership. *The Futurist*, May-June 1990, p. 18-22.
- MacDonald, J. Randall (2010) IBM Report: Working Beyond Borders, Insights from the Global Chief Human Resource Officer Study. *IBM Institute for Business Value*, p. 1-66.
- Malamud, Andres (2011) A Leader Without Followers? The Growing Divergence Between the Regional and Global Performance of Brazilian Foreign Policy. *Journal of Latin American Politics and Society*, 53(3), p. 1-24.
- Medina, Marc (2011) Leadership and the Process of Becoming. *Journal of Existential Analysis*, 22(1), p. 70-82.
- Ng, Pak Tee and Liang, Thow Yick (2010) Educational Institution Reform: Insights from the Complexity-Intelligence Strategy. *Journal of Human Systems Management*, 29, p. 1-9.
- Niebuhr, Annetrin and Stiller, Silvia (2003) Economic Trends: Territorial Disparities in Europe. *Journal of Intereconomics*, May-June 2003, p. 156-164.
- Noor, K. Ahmed (2011) The World is More than Complicated. *Mechanical Engineering*, November 2011, p. 30-35.
- Seiler, Stefan and Pfister, Andres (2009) Understanding Leadership Behaviour through a dynamic five-factor model of leadership. *Journal of Leadership Studies*, 3(3), p. 41-52.
- Subramaniam, Mohan and Youndt, A. Mark (2005) The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal*, 48(3), p. 450-463.
- Van Vugt, Mark (2006) Evolutionary Origins of Leadership and Followership. *Personality and Social Psychology Review*, 10(4), p. 354-371.

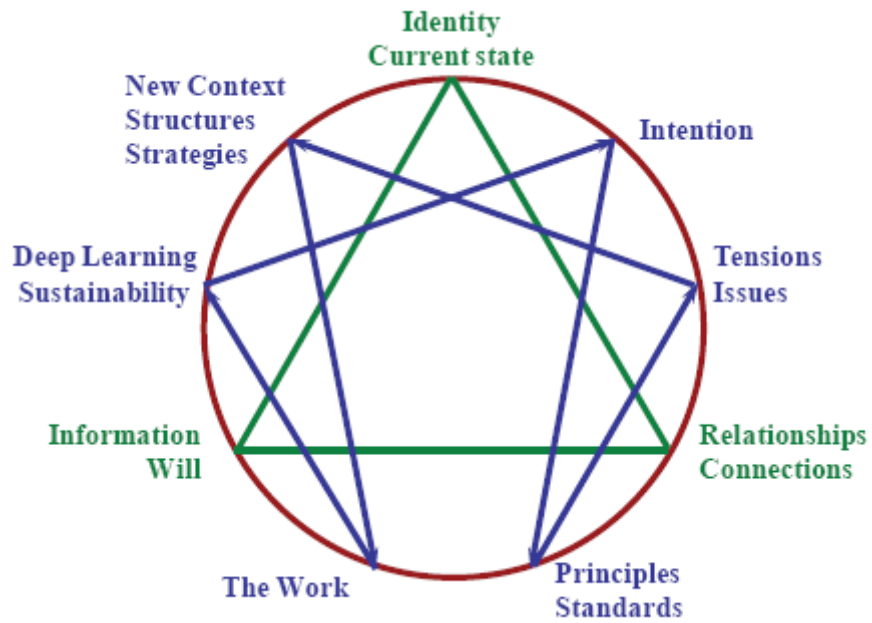
APPENDIX A

Comparison of properties on open and complex systems

Properties of open systems		Properties of complex systems	
(1) Importation of energy	Energy is imported from the environment.	(1) Importation of energy	Energy is imported from the environment.
(2) Throughput	Inputs are converted through the use of energy.	(2) Throughput	Inputs are converted through the use of energy.
(3) Output	Produced output is exported into the environment.	(3) Output	Produced output is exported into the environment.
(4) Cyclicity	System events are structured by cycles.	(4) Chaos	CAS are poised systems that function at the edge of chaos for optimal buffering and adaptability.
(5) Negative entropy	The transformation cycle is a cycle of entropy, leading to disorganization or death. To survive, negative entropy is acquired by storing energy from the environment.	(5) Emergence	Some activity occurs that is not induced by the environment, but instead, results from the interdependence of system components.
(6) Information input, negative feedback, and the coding process	Inputs consist of information and signals about the environment and system functioning, as well as materials that are transformed. Negative feedback allows for necessary correction. Information must be coded appropriately to be meaningful.	(6) Information input, negative feedback, and the coding process	The interactions of system agents or elements with one another are need-based, bottom-up, and emergent, and are associated with the presence of catalysts and feedback mechanisms.
(7) Steady-state and dynamic homeostasis	The basic principle is the preservation of the character of the system. In countering entropy, systems move toward growth and expansion, as they tend to import more energy than is necessary.	(7) Adaptation	The basic principles are preservation and adaptation of the character of the system.
(8) Differentiation	There is movement toward greater differentiation, specialization, and elaboration.	(8) Differentiation	N (the number of sub-units) blends with the intra-system variables K and P and the inter-system variable C to achieve a poised system.
(9) Integration and coordination	Greater integration and coordination are necessary to counter the tendency toward greater differentiation.	(9) Integration and coordination	The intra-system variables K and P blend with N and the inter-system variable C to achieve a poised system.
(10) Equifinality	The same final state can be reached from differing conditions and a variety of paths.	(10) Path Dependence	Unique final states may be reached due to sensitivity to initial conditions.

(Source: Schneider, Marguerite and Somers, Mark (2006) Organizations as complex adaptive systems: Implications of Complexity Theory for Leadership Research. *Journal of The Leadership Quarterly*, 17, p. 353.)

APPENDIX B
The Process Enneagram



(Source: Dalmau, Tim and Tideman, Jill (2011) The Middle Ground: Embracing Complexity in the Real World. *Journal of Emergence: Complexity and Organisation*, 13(1-2), p. 85.)

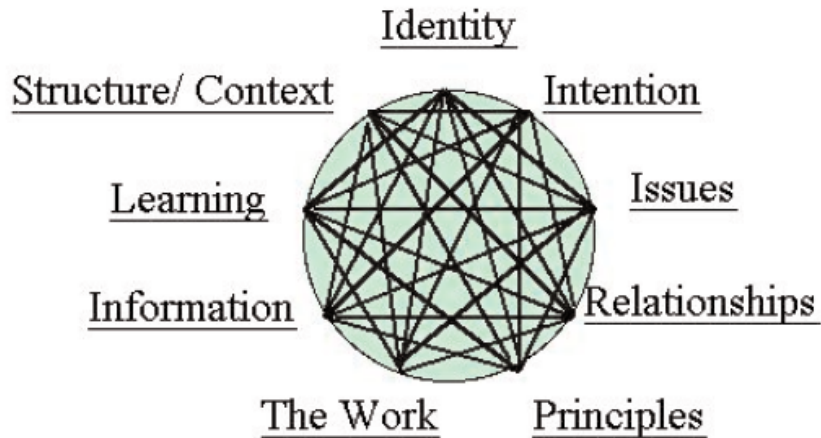
APPENDIX C

MOST FREQUENTLY IDENTIFIED TRAITS OF GOOD LEADERS AND FOLLOWERS

Leaders:	Followers:
1. Honest	1. Support decisions
2. Communicator	2. Make suggestions
3. Listener	3. Loyal
4. Visionary	4. Trustworthy
5. Patient	5. Ethical
6. Decisive	6. Team player
7. Developed people, positive, objectives, high energy, self-drive, charisma, passion	7. Positive attitude
	8. High energy
	9. Take responsibility
	10. Acknowledge the leader
	11. Listener and a good communicator

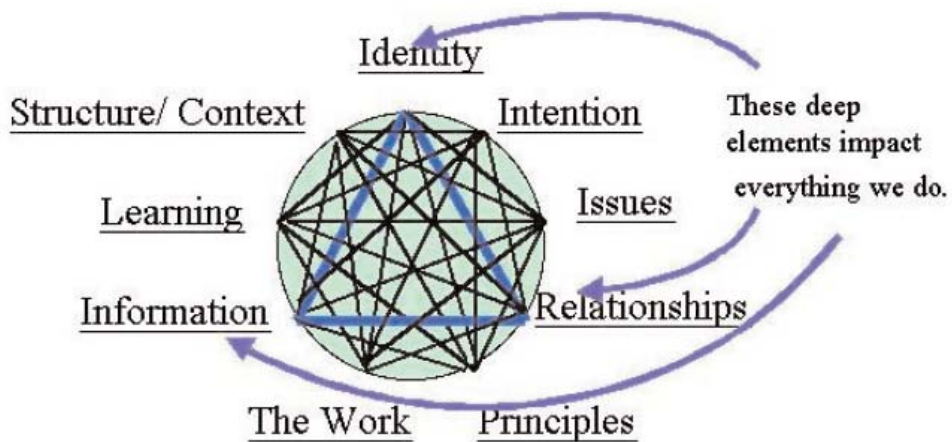
(Source: Cavell, P. David (2007) Leadership or Followership: one or both? All successful leaders need good followers. *Journal of Healthcare Financial Management*, November 2007, p. 144.)

APPENDIX D
The “Process Enneagram” for leadership



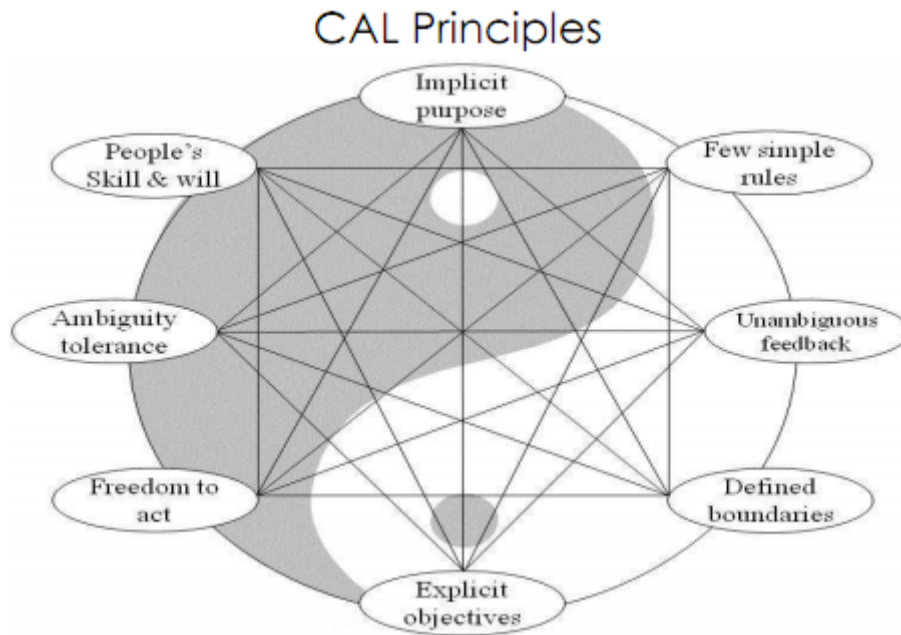
(Source: Knowles, N. Richard (2001) Self-Organising Leadership: A way of seeing what is happening in organisations and a pathway to coherence. *Journal of Emergence*, 3(4), p.113.)

The “Process Enneagram” for leadership
(the domains for self organising)



(Source: Knowles, N. Richard (2001) Self-Organising Leadership: A way of seeing what is happening in organisations and a pathway to coherence. *Journal of Emergence*, 3(4), p.121.)

APPENDIX E
Complex Adaptive Leadership Principles



(Source: Obolensky, N. (2010) *Complex Adaptive Leadership: Embracing Paradox & Uncertainty*. Gower Publications, p. 126 (Figure 7.11))