

Complex Nature of Human Dynamics

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Society is a web of interactions and interrelationships of individuals and their natural and artificial (human-made) worlds. The dynamics of this web and the processes of its self-organisation, evolution, and transformation are at the focus of the study of *social complexity*. This study is centred in the rich conceptual basis of the non-linear science – the science of turbulence and chaos, emergence and fractals, self-organisation and criticality: the science of complexity.

The word “complexity” originates from the Latin word “*complexus*” which means “totality”; the science of complexity explores totality of dynamics – forces, energies, substances and forms – permeating the universe and connecting everything that exists in an all-embracing web of dynamic interrelationships and interactions. Different are the scales of manifestation of this web – micro and macro, organic and inorganic, animate and inanimate, natural and simulated, individual and social, plant-like, animal and human. However different the scales of the web, its dynamics at each scale exhibit similar characteristics and regularities. The study of these characteristics and regularities has brought forth a whole new paradigm – the *paradigm of complexity* – based on the research field of nonlinear dynamics. This field includes also human dynamics: individual and social.

One of the greatest physicist of the 20th century – Heisenberg – once said: "The same regulating forces, that have created nature in all its forms, are responsible for the structure of our psyche and also for our capacity to think" (Heisenberg, 1971). The universe does not select a special kind of dynamics to manifest through humans and another – through the rest of the existential forms. Human dynamics form their level in the wholeness of the self-created, self-propelled and self-sustained universal dynamics. The challenge for the social researchers is to be aware of this wholeness and reveal the ways it manifests through social complexity.

1 Human Experiential Space

Human Experiential Space is the space where the trajectories of our lives unfold; this unfolding is driven by human dynamics responsible for the synergy of the three vital ingredients of the human nature: body-mind-soul. We call the space where the human dynamics act *experiential* (Dimitrov and Ebsary, 1997) in order to emphasise the importance of experience in the unfolding of each trajectory of life. When experiencing an event (phenomenon, process), we perceive it through our senses and associate with it thoughts and feelings in order to interpret and make sense of it, feel and understand the ‘message’ or ‘lesson’ that it offers to us, connect it with other events from the past, or project it on our plans and dreams about the future. Because of this, our experience is inseparable from our thoughts and feelings – emotions and ideas, aspirations and endeavours, intentions and ambitions, longings and dreams, spiritual beliefs and revelations; in other words, our experience is inseparable from our consciousness.

The experience feeds our consciousness with real-life signs and symbols; by interpreting and understanding them, the consciousness enriches our experience. The richer – broader and deeper – the experience, the stronger it affects the growth of the consciousness.

Although the tandem ‘experience-consciousness’ is unique for each individual, the human dynamics behind this tandem – dynamics which make the senses work, the mind coordinate them, and the soul illuminate and inspire the mind – are of the following three types:

- (1) dynamics which keep one’s consciousness oscillate around one and the same level of development;
- (2) dynamics which drag one’s consciousness down: pull it towards lower levels of development;

- (3) dynamics which stimulate the growth of one's consciousness: expand and push it towards higher levels of development;

Similar types of dynamics have been studied and described thousands of years ago by the Vedic sages – ancient Hindu thinkers and Yoga practitioners; they called them “*gunas*” – a Sanskrit word meaning “qualities” and used to characterise the primary forces of nature and the subtle energies pervading every aspect of existence and strongly influencing human lives (Jacobsen, 1999).

2 Three Types of Human Dynamics

2.1 The First Type: Ego-centred Dynamics

The dynamics of the first type are the most widely spread in the human nature: they have preserved our ego-centred consciousness almost unchangeable since the dawn of the human civilization.

The driving force of these dynamics is the force of human desires; all kinds of desires constantly emerge out of the body-mind-soul interactions, and agitate us until we undertake actions to satisfy or calm them. The largest part of the emergent desires can be characterized as egoistic: their satisfactions pursue one's own interests and advancement.

Western civilization is overload by inordinate multiplication of materialistic (consumption-oriented) desires and longings. As far as their satisfaction requires money, the vast majority of people in the world work hard to get it, and because of this, become restless and stressful, competitive and greedy. Especially in today's era of frantic globalisation, when the number of financially enslaved people has dramatically increased, the work of the largest part of humanity becomes harder and yet worthless: the more we work, the less we have (Dimitrov, 2001). Together with the competitiveness and greediness, envy and animosity, pride and anger, fear and anxiety, hatred and vindictiveness, cruelty and violence find their ways to us, as they are qualities entirely supported by the ego-centred dynamics. These qualities strongly impede the growth of the individual consciousness, fill it in with egoistic motives and drives, and keep it stuck to selfish thoughts, feelings and actions, with no power to transcend their limitations.

As far as the ego-centred dynamics support also one's persistence in pursuing a chosen goal, in studying and obeying instructions of a preceptor, protecting people, offering gifts, performing acts of sacrifice, charity, etc., the described dynamics can gravitate in direction of further developing certain aspects of the individual consciousness. Unfortunately, this kind of partial developments are not enough to support the holistic growth of one's consciousness; the pull of the selfish desires eventually prevails and drags the consciousness back to the orbits of the ego.

The Vedic thinkers and practitioners called the *guna* corresponding to this type of dynamics “*rajas*” – a Sanskrit word meaning “passion”, “energy”. Rajasic dynamics have ‘boiled’ within the human nature along the whole history of people's existence on the planet. The moments of joy and happiness produced by rajasic dynamics pass quickly; the ultimate fruits of these dynamics are stress and exhaustion, disappointment and sorrow, pain and suffering.

2.2 The Second Type: Dynamics of Delusion

The second type of dynamics manifests in individuals without any urge to know and understand the world they live in; they are ready to give up any task, if it requires labour, diligence or patience. Delusion, ignorance, and inertia are the typical outcomes of these dynamics, plus qualities like stubbornness and haughtiness, vanity and cupidity, wrath and unforgivingness, hostility and evilness of disposition, ill-speaking of other people and indulgence in calumny, contempt, want of vigour and sincerity, stolidity, absence of self-control, crookedness, vileness of behaviour, fear, indecision in respect to action, lassitude, grief.

Deluded minds lack capacity to discriminate between truth and falsity: they are easily stupefied, enslaved by dogmas and fanaticism, manipulated and brainwashed. When this happens, the dynamics of delusion accelerate up to such degree that they darken people's consciousness entirely and make it impossible for them to genuinely experience, reason, or create; the only thing the

deluded are able to do is to obey their instincts, repeat like parrots what the ‘experts’ say, and do what the ‘leaders’ want them to do.

The ancient Hindu philosophers called the *guna* corresponding to this type of dynamics “*tamas*” – a Sanskrit word which means “darkness”, “ignorance”, “inertia”.

2.3 The Third Type: Dynamics of Enlightenment

Individual consciousness can grow only, if it supported by its inner sources for growth. Enlightenment cannot be borrowed from another person or poured into one’s head from an external source. The urge for growth in intelligence and wisdom must come from within similarly to the growth of a seed, which cannot happen without the potential imbedded in it. And yet, there is a huge difference between the growth of a seed and the growth of the human consciousness: the seed must wait for external conditions favourable for its growth, while the consciousness can stimulate its growth by itself using its *own* power – the power of its own will and reason, its own emotions and intuition, no matter what the external conditions are.

The third type of human dynamics manifests in our urge for enlightenment – knowledge, intelligence, wisdom. Self-control and courage, contentment and forgiveness, compassion and abstention from injuring another creature, humility and modesty, freedom from vanity and egotism, absence of stinginess, meanness, wrath, cruelty, malice, laziness – these are some of the qualities sustained by the dynamics of enlightenment.

This type of dynamics is behind the most precious human knowledge – the knowledge of ourselves: understanding the reason to be born, tasks to be completed, missions to fulfilled, existential enigmas to be revealed.

The dynamics of enlightenment energise our will to experience the harmony in nature, to grasp the unity and infinity of existence, to reveal, understand, and connect with its centre before our bodies disintegrate.

The corresponding ‘*guna*’ is called “*sattwa*” – a Sanskrit word meaning “harmony”, “light”, “balance”. Peaceful and calm is the mind of a sattwic person; wise and inspiring are the sattwic words, free from selfish expectations and results are the sattwic actions, joyful and happy is the sattwic soul.

“They who abide in “*sattwa*” proceed upwards in their consciousness; they who abide in “*rajas*” remain in the middle; they who abide in “*tamas*” sink downwards” say the ancient Vedas (“*Veda*” means “knowledge” in Sanskrit).

Although the three types of human dynamics described above act in parallel in the experiential space of each and every human being, there is always a type that prevails in one’s experience. It is through resonant conscious efforts of one’s body, mind, and soul that the dynamics of enlightenment can be strengthened and made the most influential in the unfolding of one’s life (Dimitrov, 2000).

3 Capacity for Emergence and Change

The most significant characteristic of interactive human dynamics is their inherent potential to give birth to emergent phenomena and thus to bring forth changes. Ability to change is crucial for any form of life; whatever resists change is condemned to death. The change is not arbitrary or accidental but depends on a ‘law’, according to which *each thing or state of existence can only change into something already inherent as potentiality in its own nature*. Human embryo changes into a human being and not into a fish or another animal; the human being changes physically and may grow in wisdom, but cannot change, while living on this planet, into a hypothetical extraterrestrial creature or an omniscient god.

In human dynamics, an emergent phenomenon may lead to profound changes in the life of an individual and society. When the occurring changes are characterised with directedness and

persistence, they may reveal a process of self-organisation. For example, the changes in an organism from its birth to death manifest a self-organising process that unfolds in a vital co-adaptive drift ('structural coupling') with the changes in its environment (Maturana and Varela, 1987).

Various factors and conditions may strengthen or weaken the capacity for emergence and change inherent in human dynamics.

4 Unpredictability

It is hard to predict any long-term unfolding of human life, as this unfolding reflects the interplay of many known and unknown, internal and external, strong and weak, human-created and natural factors, which constantly influence one's experience, perception, understanding, knowledge, and actions. The degree of interactions of all the factors involved is so high that human dynamics becomes extremely sensitive even to minute perturbations. Minor changes of the conditions, under which human (social, economic, cultural, etc.) dynamics self-organise, may result in drastically different ways of self-organisation. For example, seemingly small changes in the budgets of the households in society can lead to a significant increase in domestic violence, little variations in rental rates, interest rates or tax rates can produce large effects on affordable housing, sustainable agriculture or energy effective transport (Young, 1992), slight increase of the price of soybeans can put under threat vast tracts of rainforest (Green and Newth, 2001), etc. The pioneer of the deterministic chaos – Edward Lorenz – called such kind of effect a "butterfly effect" (Lorenz, 1993); it can never happen in the world of linear systems.

The stock-market, human and environmental health, national economies, socio-political formations like the green or anti-globalisation movement are examples of unpredictable non-linear categories in the study of social complexity.

Unpredictability in the 'non-linear' social world is not an obstacle to understand it. On the contrary, by exploring the unpredictable dynamics of any non-linear process, one can gain insight with enormous explanatory power. For instance, it is unpredictability of the social world that helps us understand that there are no negligible human actions: even randomly chosen and seemingly insignificant actions can lock-in, accelerate and amplify, beyond our ability to control their future directions. Because of this effect, human dynamics are permanently driven out of equilibrium. In this situation it is better to be aware about their self-organising drive, the ways it manifests, and how it is affected by external and internal changes, however small they might appear.

5 Complex Causality

In the all-pervading web of dynamic interactions and interrelationships, all the entities and processes are interconnected. When the entire web contributes to the existence of even the 'smallest' thing in it, how could we distinguish any specific cause-and-effect relationship? Where everything relates to everything else in a tangled dynamic web of interdependent relationships, how can we trust any linear analysis of this web?

Having pointed this negative truth out to a reluctant world of people who seek to control nature and society for various reasons, good or bad, the human dimensions of complexity are then left with the positive task of stirring-up human creativity, helping individuals move beyond the social stereotypes, and discover their own unique ways for navigating the ocean of complexity, instead of dreaming of a safe and tidy linear haven that does not exist.

This discovery gives us a key for understanding the crucial difference between the 'classics' of the systems approaches to social reality and the 'heresy' of the social paradigm of complexity.

According to the 'classics', an effective description of a human system can always be built from the descriptions of its separately analysable parts. What is needed is to identify the forces which help keep the parts of that system in a balanced relationship, and to remove the perturbations pushing the system out of the state of balance. Although this approach never works in social reality,

practitioners continue to use it in pursuit of illusory states of equilibrium of the systems underlying behaviour of humans and society. As such states never exist, they waste time and resources pursuing mirages.

According to the 'heresy', separately analysed components can never create an adequate description of the whole. Positive and negative feedback loops permanently drive the overall behaviour of an individual (group, society) out of equilibrium, towards the 'edge of chaos', a critical zone between disorder and order, where emergence of new qualitative states takes place, and holistic transformations may occur.

When we deal with social complexity, we cannot rely upon linear model of causality. As we already pointed out, changes in the conditions under which this type of causality has been observed can significantly alter the emergent effects. We only waste time and energy when trying to force human dynamics in a pre-planned, non-negotiable direction. It is much wiser to learn how to nudge from within the social dynamics, how to manage and guide from inside their self-organising capacity (Goerner, 1994).

6 Fractals and Wholeness

Reducing does not simplify when applied to social complexity: interactions are important and interactions mean integrity and inseparability.

Theorists of chaos and complexity dispense with the idea, foundational in the logic of mainstream science, that the world and what it contains can be analysed into separated parts. In the complexity paradigm, parts simply do not exist as such distinct from the whole, to the emergence and dynamic integrity of which they have organically contributed, and the whole at any scale level of presentation consists only of *wholes* representing it at lower scale levels; so the distinction between whole and part as applied in systems science has been dissolved.

Fractals, discovered by Mandelbrot (Mandelbrot, 1982) are similar patterns repeating themselves at different orders of dimension. If one magnifies a fine area of fractal structure, one gets increased information in proportion to the new scale. Thus, the world not only looks different to the observers at different scales, it also measures differently. In every day language, this powerful mathematical insight means that the deeper one's understanding of a complex picture, the more meaningful nuances one can notice in it.

In biology we can see that every cell of the organism bears the unique genetic code of the whole organism, otherwise it would not be able to interact with other cells. Conversely, it is also understood that it is because of the interactive nature of cells that cells have elaborated this code. The *wholes* of cells and their interactions make the organism function, and at the same time the organism as a whole supports the functioning of each interactive cell.

There is a property of cells discovered by Biology that is both a compelling metaphor for the unbroken wholeness of life and at the same time a challenge to ecological and social researchers, to provide appropriately ecological categories for biological and social life. Apoptosis is an essential property of all living entities, in terms of which cells are genetically programmed to kill themselves, if not the constant interaction with their neighbours – interaction that keep them alive (Raff, 1998). No one cell is capable of living in isolation. No one living creature, no one human being either! This phenomenon seems strange to the logic that sees life as life, the inherent and defining property of all living things, striven for and sometimes lost, but belonging to the living entity and to nothing else. Yet each cell strives for death, not life, unless it is sustained by other cells which would also strive for death unless sustained by others, in a larger living organism whose life is therefore dependent not on the simple 'life' of each component cell, but on a complex mixture of life and death, life as the temporary absence of death.

This unbroken ecological wholeness of social reality in which, and through which, we exist is another manifestation of self-reflexivity, which was brilliantly captured by G^odel in the proof of his

celebrated theorem: it is possible to make true statements within a particular system that cannot be proved by use of the elements and logic of that system. This is because the system under consideration is organically interconnected with some larger system, which by itself is dissolved into another greater than it, and so on.

7 Criticality

Everyone who works in a complex organization, whether in a management, leadership, or other capacity, needs to leave aside any dreams for 'blissful' steady states of equilibrium in organisational dynamics and learn how to deal with critical states: states which are subject to sharp changes or transitions in a field, which may be single or may form a cascade. Although the complex entities have periods of relative stability ('punctuated equilibrium'), they are constantly driven towards critical states – zones of criticality (Bak, 1996) – and it is these where the practical ability of the practitioner is tested, and not in the steady state of affairs.

Chaotic dynamics are 'ruled' by strange attractors (Ruelle, 1989) – emergent phenomena with whimsically strange forms (seen when mapped on the 'phase space' – a mathematical space containing all possible states of a dynamical system). Anything off the strange attractor is 'folded' towards it, but anything on it is 'stretched' in an unpredictable way – except that one thing is predictable: it always stays on the attractor.

When dealing with social complexity, we need to understand what kind of social attractors are propelling its dynamics. What fields of social activity attract, inspire and concentrate the energy of people and what fields act as repellers of human creativity? Are there any hidden forces responsible for bringing forth specific organisational dynamics? If it happens that some attractors are detrimental for an individual (organisation), how can the emergence of new attractors in his or her experiential space be catalysed which are in favour of the individual (organisational) growth?

According to Yorke, chaos is ubiquitous: a chaotic orbit can come arbitrarily close to any point in the phase space (Yorke, 1996). Since chaos can occur on every scale of the holistic dynamic structure of the universe, people could use instabilities in order to manipulate the motion of energy in the society and nature on a very large scale. This becomes possible due to the butterfly effect: little changes may lead to significant results. The butterfly effect gives an incredible power to the hands, brains and hearts of practitioners working in various fields of social activity.

Self-organised dynamics are endowed with capacity to move towards zones of criticality in the experiential space – zones which the researchers in chaos call 'edge of chaos' (Packard, 1988); one can reveal such zones on the frontier between order and chaos in the experiential space of an individual as well. In a region of any imposed social order (as under dictatorship) or social chaos (as under anarchy), the dynamics of human life would not be able to adapt and evolve. It is on the frontier between order and chaos – at the 'edge of chaos', – where a delicate dynamic balance can emerge, impregnated with seeds of creative transformations. While we cannot be masters of the transformations at the edge of chaos, we are not slaves to them; we co-create them. This is an entirely new challenging way of perceiving the role of those who seek to be practitioners working in the social paradigm of complexity, agents of change in the 'global age' of complexity.

"In a recursive, complexly interwoven world, whatever one does propagates outward, returns, recycles and comes back in a completely unpredictable form. We can never fully know to what results our action leads. We take action; the action can have a very potent shaping effect. Then we relax the drive to control and allow the process to unfold – the process learns, shapes and changes itself through all its inseparable components, not under the direction of one of them only. Together with overall changes in the process, we also change, almost unnoticeably, without any strain." (Goerner, 1994)

8 Self-Organization and Vorticity

Complex interactive dynamics give birth to forces of self-organization arising spontaneously from seemingly disordered conditions.

How can entirely new structures emerge from the multitude of dynamic interactions within a complex system? The concepts of *vortex* and *vorticity* shed some light on this stunning phenomenon.

Vortex is an icon of complexity; it provides an image for emergence of a dynamically stable pattern in turbulent conditions. The vortex is characterised by a centre and a particular kind of balance between centripetal (outwardly directed, 'explosive') forces and centrifugal (inwardly directed, 'implosive') forces. Examples of vortices in nature are eddies, whirlpools, whirlwinds, tornadoes, maelstroms, hurricanes.

The vortex is a metaphor of oneness (wholeness) which is centred, and which creates and preserves emergent forces. It is a metaphor of spontaneously formed unity-in-motion, devoid of artificially built foundation or imposed structures. There is no rigidity in the vortical dynamics, no pre-designed boundaries, no extremes and polar points, no division.

Vorticity is capacity of the interactive fluid dynamics to form vortices and, therefore, to give birth to emergent forces. The larger the vorticity, the greater are the magnitudes of the implosive centripetal and the explosive centrifugal forces. Where these forces are coming from? They do not come from outside the vortex; they come from *within* it, as a result of suddenly intensified dynamic interactions of the entrained masses of fluids with different characteristics.

Similar emergence occurs in the space of the human thoughts and feelings, ideas and emotions, longings and aspirations, spiritual beliefs and dreams. The whirling motion of these 'immaterial' emanations of the human brains, hearts, and souls can generate forces of magnitudes comparable with the magnitudes of the forces produced by tornadoes and whirlpools. Only the scales of the involved dynamics of nature are different; the forces emerging out of tornadoes and whirlpools are at the macro scale – the scale of external natural phenomena and processes, – while the forces emerging out of our whirling thoughts and feelings are at the micro scale – the scale of our inner nature. Same all-embracing dynamics, different scales of manifestation!

What injects vorticity in the space of our emotions and ideas, aspirations and dreams, and thus stimulates emergence of creative insights? It might be our urge to know, our thirst to explore the world and ourselves, our motivation to go beyond the limits, which the ignorance puts on our understanding of reality, both outer and inner. While exploring the interplay of human dynamics, the social paradigm of complexity empowers us in our endeavour to decrease the denseness of the layers of ignorance and learn to transcend them.

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