



Infusion of Knowledge, Energy and Time in Internet Age

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Abstract Energy and time are both firmly established in the scientific literature, but knowledge remains elusive and in a historic context bears a philosophic and mystic shroud. In Internet age, knowledge is essential for every consistent, cogent and optimal action. Every well-perceived action supports a function in life and energy is thus essential to continue to enact the functions of living. Continuation to live thus entails time from very small durations such a heartbeat to large blocks of time in life such as a lifetime itself. All microbial to physiological functions become based on these elements of knowledge. A practical way to treat knowledge is to divide it into manageable elements around the objects that are knowledge centric. Objects and knowledge associated with them are bound in syntactic, semantic and contextual framework and bound by a duration of time. A convolution to bind nouns and verbs together is used in the particular context in which the element of knowledge is generated. This general approach offers flexibility to generate new knowledge elements that can be grouped to form larger bodies of knowledge and to be able to use established knowledge bases to generate and communicate bodies of knowledge.

Keywords Knowledge, Energy, Time, Recursive Loops, Knowledge Elements, Motivation, Human Actions

1. Introduction

Communication networks and Internet in particular, are becoming progressively more intelligent. Personal communication systems can be configured more and more readily on handheld devices and Android systems, running on accurate crystal clocks [1]. The social dependence of device and personal communication systems is symbiotic for the younger generation of students and the computer literate population of the society. A knowledge worker in an Internet and device vacuum is Industrial worker without electricity and power tools during the 1890s. This shift in trend of thought and actions leads the more fundamental questions about the short and long-term effects on society, its progress and the role of progressively more Intelligent Networks and Internets.

If knowledge and wisdom are the building blocks and cornerstone of any society and culture, then the modern machine have a definitive role in which we perceive and deploy knowledge in our daily life and activities. Constraints of time, energies and intelligence bind the freedom of actions in the durations of allocated time that is shared between the essential needs of humans. Physical and intellectual energies being limited, bind the allocated efforts that are shared between the social and ego needs. Intelligence plays a dominant, decisive and integrative role between gratifications all the outstanding needs.

These needs furnish the motivational energy to drive lives. In gratification of such needs, both positive and negative actions are performed discretionarily. Positive actions result from the wisdom and ethics components of human nature and vice versa. A large percentage of the energies is used in direct need gratification but a fraction is also used as contemplation towards betterment of society and all human beings in a “selfless” mode that contributes positively to the society and culture. Hence, it becomes essential for social scientists to enhance



and encourage the positive and as far as possible to suppress the negative influences of the Internet culture. Human nature tends to favor the slide toward the negative more preferable by those who wish to live in a stagnant status quo corner of culture rather than the push towards positive change in society and culture that needs strife, patience and persistence.

In this paper, we present an integrative portrayal of the modern societies and cultures that face the dilemma that Internet age has brought with it during the last three decades. The impact of computers, devices and networks during the 2020+ decades is also projected on the direction and extent of social and cultural changes

Habits and psyche run on slower time clocks tending to retain the status quo. A few years in the computer era have been a few decades for the public and culture to follow. The younger age groups react more quickly to leave behind an older generation to follow at their own pace; even so, most of the intricacies of the Internet revolution are never harnessed. The generation gap becomes steeper and deeper. Perhaps it is a healthy adjustment but the overall social and cultural changes can be rapid since the younger generations set the trend. Fortunately, the mid-age group of politicians can regulate the overly enthusiastic business community that can accelerate the changes in the commerce of devices and moneymaking deals that can bring more hurt than help to the society. Karl Marx [2] had eluded this conflict in 1860s. Whereas Marx presented two sides of wealth in society; i.e., between the wealthy and the poor, we present the two sides of the wealth of information and knowledge; i.e., between the informed and the uninformed. Further, we present the extent and use of current devices, Internet and machines and impact of the new Intelligent Internets, knowledge, concept and wisdom machines on the social progress or the regress of the society and culture.

2. PathWays of Knowledge in internet Society

A rather simplistic approach to the generation of knowledge from observed, documented and confirmed information was presented in Ref. [3]. In the 2006 and 2007 timeframe, a series of major steps were omitted to affirm a scientific methodology that the path between binary bits of data and the effect on society can indeed be a prolonged but a continuous process (See Figure 1). This simple path to knowledge was termed [3] as the knowledge trail. The representation of the migration path by a “graph”, or a series of graphs, enables highlighting and generalizing the migration trail with key nodes and links within the graph. Any patterns that repeat and get recursive can more easily be represented and later encoded as computer routines or as recursive processes. In establishing a path between the data domain and the ethical value structure of any given society, the crucial nodes (B, D, I, K, C, W and E), and the progressive pathway is shown in Figure 1.

The role of digital numerical and logic circuits to deduce data structures from binary bits, and then from data structures to information has been proven consistently over the last five decades. These approaches of graphing, branching, algorithms, and optimization, minimizing resource utilization have been deployed in the past to streamline many generic processes in the basic von Neumann machine to the supercomputers.

From a modern perspective, the diagram shown in Figure 1 is rudimentary and inadequate to include the role of modern machines and the sophisticated role of the knowledge workers. The struggles of the 21st century worker are more than having a loaf of bread and jug of wine [4]; instead they are directed to searching the nation and globe for finding novel solutions to greater problems (such as the changing climate, the Ozone layer, the renewable energy, etc.) that challenge humankind. The impact of human actions on Nature, society, culture, nations, wars and peace have had a severe impact after Johnson’s Vietnam war and Bush’s Iraq invasion in spite of UN’s finding of *no* nuclear weapons! The society is much wiser not to be misinformed and misled by deceitful politicians.

To accommodate the sophistication ingrown in the society over the last two decades, the knowledge trail of Figure 1 has additional nodes on the two sides and shown in Figures 2a and 2b. The long-term impact of human actions on Nature are thus included. The direction of the impact is evident with machines on the left and humans on the right. Perhaps the critical node to flow through is the transitional K node in Figure 2 since numeric-verbal and graphical information, generated by machines have psychological and visual content. The interpretation becomes fuzzy and individualistic. The effectiveness of machines starts to become probabilistic and the accuracy starts to dwindle. In essence, since concepts and wisdom are culture dependent, the definitive programming of such machines is a best-fit solution, prone to be error prone and results can be misleading.



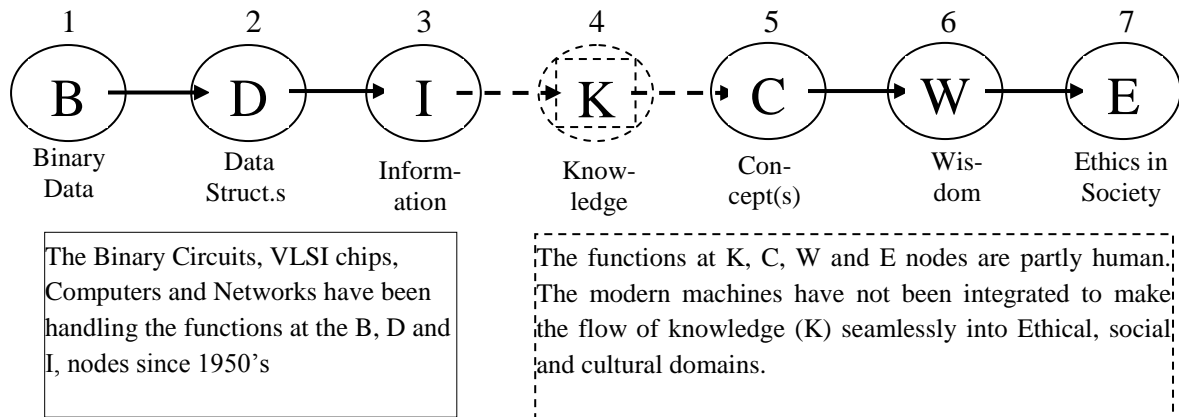


Figure 1: The basic knowledge trail that focuses on knowledge is depicted as the prime mover for the progress of any society by offering novel concepts at (C), providing cultural and social wisdom (W), and finally integrating the wisdom into the ethical framework of the culture and society.

3. Generation of New Knowledge Elements (kels)

3.1 Role of Knowledge and Flow of Time

In order to transform information into knowledge, we have reintroduced the fact the information is based on events and experience in the prior time domain (i.e., from $(t - \infty)$ to current instant t), whereas K is for following time domain (i.e., from t to $(t + \infty)$)¹. Hence, all information and knowledge both assume time varying and dynamic characteristics that can acquire social and cultural interpretations.

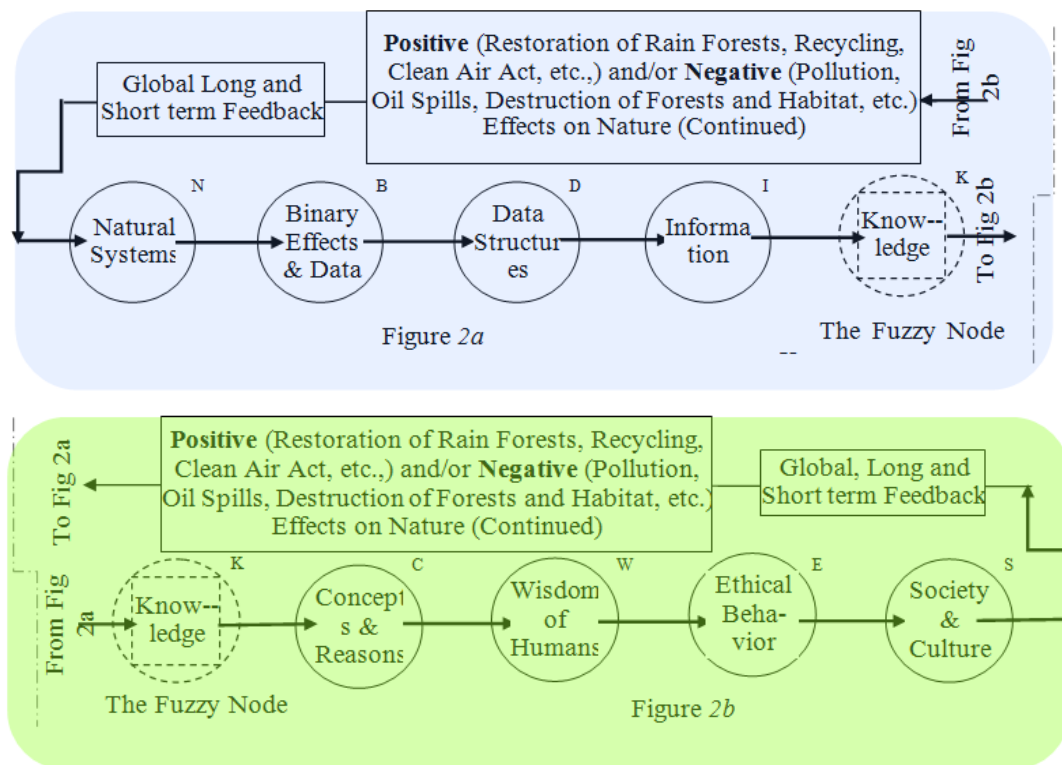


Figure 2: The extended knowledge trail that focuses on the effects of the actions of human beings and organization on Nature (N) and Society(S). The role of the knowledge node K, starts to get fuzzy because of the long feedback time of the actions on Nature that supports the species

¹ The limit $(t - \infty)$ simply refers to past and the limit $(t + \infty)$ simply refers to future.

3.2 Notions and Features of Knowledge

It is also necessary to introduce the notion that universal knowledge is infinitely large and incomprehensible by human and non-representable in any machine. Two frameworks will enable humans and machines to circumvent this limitation.

3.2.1 Compartments and Boundaries

Fragmentation of knowledge is a technique readily learned from computer science and programming. Large problems are fragmented into smaller and well-bounded problems and strung together (intelligently) to offer one or more possible ways to solve the larger problem. Large software projects are similarly partitioned, solved concurrently or sequentially and executed on machines. In management this approach is routinely implemented in PERT [5] and CPM [6].

Knowledge like wealth needs to be compartmentalized and bounded for it to be managed by humans and machines. Within this constraint, modules of knowledge can exist as partially independent blocks (known as knowledge elements or *kels*, or as Δk 's) for a limited time and in a limited cultural and social setting. The rules of Arithmetic for summation, multiplication, division, exponentiation, etc. start to lose the mathematical precision as drugs and treatments lose their exact impact in medical sciences. However, broad interpretations of such rules permit the mind to explore knowledge spaces. The rules of Logic also suffer rapid loss of their deductive powers, but the inductive, deductive, propositional and projective logic may offer some new colors as to the dynamic changes of knowledge.

3.2.2 Convolutions for Programmable Control of *kels*

In the knowledge space where modules can be manipulated by humans and machine, the tool for manipulation of Δk 's is suggested as a convolution or (*) since it is generic and it can permit machines and human to dissect the element Δk itself, decompose and recombine selected one or more Δk 's to isolate them for further adjustments and fine tuning. This capability permits knowledge scientists to arrange, recast and/or re-bundle *kels* into larger *KELS* or ΔK 's. This is a super-process rather than a process that the normal CPU's can handle. The typical binary operation code (OPC for numeric and logical operations) thus becomes knowledge operation code (KOPC) that can operate on numerous *kels*, or knowledge objects, their functionalities and/or components.

3.2.3 Utility of *kels* and *KELS*

For any elements of knowledge to be significant must be have a utilitarian value. Much like unit of currency or a drug in medicine, *kels* should serve a purpose; larger and super-*KELS* retain a longer and more significant value or utility than the smaller *kels*. Human communications now start to imitate the flow of electrons in circuits, flow of photons in light, flow of ATM cells in FO networks, or even the flow of water in channels, etc. Finally, the flow of *kels* in cogent blocks constitutes human speech. When an organized structure in the flow is established, the super-*KELS* (or $\sum KELS$) have life of their own in the society and culture.

3.2.4 Flow of *kels* and *KELS*

Knowledge flow when appropriately organized and controlled resembles to some extent the flow of current. The driving potential is the difference between the knowledge potentials (KnPs) of between the objects. The return path for the current is not essential. Knowledge flow has some aspects similar to those of flow of the optical energy in fiber optics since knowledge has numerous aspects such as what, when, how, where, who, what about, what then, etc., like light energy has numerous wavelengths, though not as tightly packed as in the WDM or the DWDM [7] systems. Human beings who are the ultimate transmitters and recipients of knowledge operate with a certain degree of latitude for relaxed communication and retention of knowledge from tiny *kels* (Δk 's) to super-*KELS*. The utility of these *kels* varies by the importance of the *kels* in the context and the directionality of the communication for form the next higher level of *kel*.

3.2.5 Energy to drive *Kels* from its Source

The outburst of *kels* from its source has numerous precedents. The solar spot activity sends fantastic amounts of energy in space or in a more subdued case, the sun send vast amounts of energy to the earth every morning. In the communications arena, the outburst of *kels* is alike that of photon from light energy sources such LEDs and laser sources in optical systems. In the voice communications with human beings at the transmitter and at the receptor, the auditory energy is from the vocal cords to the eardrums. Both are driven by the physiological



energies. Machines being program driven will receive the energies from the machines. The protocol and coding are generally standardized and the communication is thus simplified.

When *kels* are machine driven² for human beings, syntactic, the semantic, the contextual, the linguistic and the laws of grammar need to be encoded thus making the meaningful conversation (rather than announcements) between machines and human being more demanding and elaborate. Further, the decoding of human input to *kels* consists of equally complex and elaborate processes. Hence, the flow of streamlined *kels* between humans and machines need special hardware, software and systems.

3.2.6 Knowledge Science Aloft from Other Sciences

Due to the inherent complexities in human communication, the mechanics of the flow of knowledge is not identical to the flow of any of the other physical or scientific entities, even though there might be some resemblance. However, the extraction of knowledge from information by machines appears feasible, if the laws for creating *kels* from information can be streamlined. The machines can then systematically arrange the *kels* to large *KELs* and present knowledge rather than information by adhering (as closely as possible) to the laws of the syntactic, the semantic, the contextual, the linguistic and the other laws of grammar. Most compilers of higher-level scientific and business languages have the laws of syntactic, the semantic and code generation embedded in them. In a sense, the human interface to allow for differences in individuals, societies, cultures and nations appears to be challenge that confronts programmers.

3.2.7 The Language of Knowledge

Knowledge language is a new language in its own right. The laws of grammar are at least twice more elaborate to be able to communicate with humans at any time, at any place, in any language, in any society, in any culture, and any nation. The communication needs intelligent, entirely human and non-robotic. This challenge appears insurmountable as communication over the cellular networks during 1800s.

In this context, we propose an approach of segmentation outlined in Section 3.2.1 that is also deployed in the design of computer based higher-level language compilers with syntactic and semantic analyzers and the code generators. In the knowledge language processors, the input and output processors need as tight a coupling as the biological nature that couples the vocal system (VS) with the auditory system (AS). The guidelines appear to be founded in the biological nature of the two coupled-systems. Barring the immediate I/O processors for knowledge language, we propose building a link that converts information (Box I, Figure 2) to knowledge (Box K, in Figure 2).

4. ANATOMY of knowledge elements or *kels*

Knowledge and its elements (*kels*) have life of their own. Since all lives depend on some knowledge (encoded, inherited and learned) to live, the *kels* also are alive and active as the genetic codes in seminal cells, bacteria in physiology, education and skills in minds. Their organization, arrangement and management leads to the differences between human beings. These three functions are somewhat arbitrary and lead to a healthy or a sick life in body, mind, society and soul. In the rest of this section, the disciplines and approaches in medicines, education, management, and psychology are imported in the generation, organization and execution of *kels* to live a healthy life.

Time and needs are equally important to life. In essence time in life, needs to live-on, knowledge and energy to gratify the deficit need at any instant of time form the vertices of an equilateral triangle that spins and orbits about the focus of existence of all species, all the time (T), at all the locations (L) in the universe that are energy (E) centric. If the X, Y and Z axes now become the T, L and E axes, then a very flexible space for the existence of all species.

The psychological firm-hold in this fluid T, L, E space is the organization of needs and their organization. Cosmic energies and the physical location in the universe are beyond discretion and being earthlings, the evolution of the earth and the astronomical energies that confine the boundaries of existence. Nevertheless, within these constraints, the sciences provide ample freedom to be scientific in the pursuit of knowledge as a scientific entity.

² Simple instructions and announcements generally consist of transmitting, encoded speech to the speakers.



4.1 Structure of Needs That Drive *kels* and *KELs*

Needs of species have been reported in detail from almost all perspectives. Two structures that appears most pertinent to the study reported in this study is shown in Figure 3 and it becomes the source of energy to make up the E axis in the T, L, E space. The diagram is dynamic, and life-dependent to be compatible with the other two axes. In its own right all the three axes are hyper-dimensional to accommodate the complexities of most aspects of life on earth.

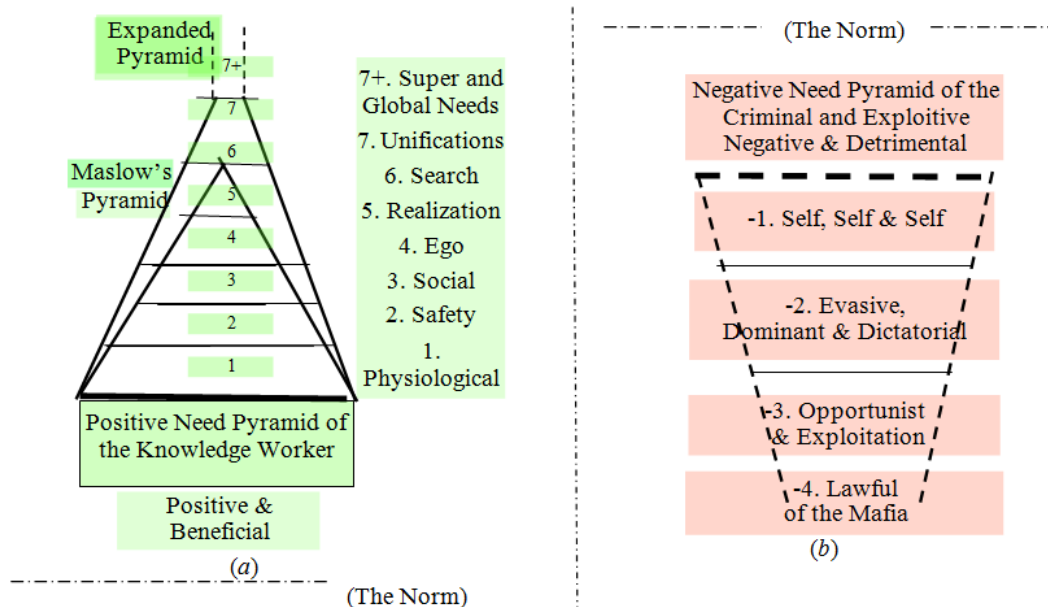


Figure 3: Two sides of human inclinations that confine and constrain the attitudes and modality of behavior in the environment, society and culture. The dominance of positively programmed knowledge and wisdom machines propel the forward movement. Conversely, the opposite is true based on the misdeeds of individuals and corrupted organizations

In Figure (3), the left side (a) indicates the Self (individual aspects between levels 1 to 5) that makes an individual functional and self-sufficient and perhaps a selfless side (levels 6 and 7 to 7+) that makes a human being constructive, creative and beneficial to the society, culture, nation, etc. The right side (b) indicates an all absorbed Self (individual aspects between levels -1 to -4) that makes a human being consumed on a selfish side. These are two extremes sides. In reality, most human beings behave in a healthy balance and not reach the entirely selfless (levels 1 to 7+) or the entirely selfish (levels 1 to 4) to the extent that the individual is a detriment to the society.

5. Motivational Aspects of Human Beings

Actions and deeds result from motivations. Not all the motivational forces are positive that help the society to be progressive. Conversely, in some corrupt societies, the negative motivations corrupt the societies still further. Deficit and outstanding needs at any instant of time provide to energy to act for the next instant of time. Intelligence intervenes. Humans tend to act intelligently and economically to derive the maximum utility for the energy and resource spent. This behavior (within the limits of their own intelligence) of all species is well documented. Human beings have numerous options at this stage with the entirely selfish behavior (of the crooks) to the entirely selfless behavior (of the righteous). The machine imitating human behavior need to be primed based on the traits and the circumstances from the knowledge banks of the particular individual. However, individuals are not entirely rational every time thus adding an additional uncertainty in the analysis. Thus, the machines can predict the action with a derived level of confidence.

When such behavior patterns are integrated over a population in a culture or a nation, a certain degree of confidence is achieved. Such situations are entirely common in hard sciences as well. Whereas it is impossible to predict the movement of an electron or a photon, the laws of conduction and optics are well documented. A similar approach is used in the flow of *kels* and *KELs* that influence the actions leading to positive or negative



actions in a culture or a society. For instance, a positively primed society can lead to enhancement of knowledge that prompts further actions towards a better society and vice-versa. The methodology suggested here defines a direction for the development of programs for the machines to solve social and cultural problems in a positive direction. Equally true is the case of corrupted machines that will generate a degradation of the culture or society. Between these extremes, social machine can suggest useless verbs (actions) that result in wasted time and resources and sometimes create embarrassment. For example, Trump-Ukraine initiative [8], Johnson's Vietnam's war [9], Bush's Iraq's incursion [10], are misdeeds that have permanently defaced the Office of the Presidency in the United States. In many cases, the attire of incompetence is the robe of deceit.

In this Section, we present two diagrams (Figures 4a and 4b) that indicate the functions of any elite society with aid of knowledge machines in contrast to how the mafia minded individuals and institutions will work (with surprising accuracy and similarity) in the opposite direction. These two fundamental inclinations of human beings have divided the society from the earliest time and also active in the knowledge domain to the extent it is used to integrate the society or polarize it. New knowledge is also created accordingly.

5.1 The Practice of Good and Genesis of Positive *KELs*

The role of the modern and future machine starts to dominate the functionalities of the elite in most progressive and forward-looking societies, cultures and nations. Such machines are initiated, funded and their development is ensured by the stable organizations and Science Foundations. It is important to note that the development of such knowledge (see top part of Figure 4), *kels* and *KELs* are a byproduct and a partial (and short term) result. The (Noun) objects (no^+ 's and NO^+ 's) that performs the (Verb) functions (vf^+ 's and VF^+ 's) with a positive convolution ($^{*+}$'s) between the two generate positive kel^+ 's and KEL^+ 's. When organized and positioned in the time-frame these kel^+ 's and KEL^+ 's offer minor and major innovations, inventions and breakthroughs in the societies, cultures and nations. Examples of such contributions to the society have come through from the sponsoring of the Space Program in the US, the NSF, NIH, etc. Major medical benefits have also resulted.

5.2 The Practice of Evil and Genesis of Negative *KELs*

Irresponsible regulation ($^{*\pm}$) of the Federal agencies of negative (Noun) objects (no^\pm 's and NO^\pm 's) and (Verb) functions (vf^\pm 's and VF^\pm 's) with distorted convolutions ($^{*\pm}$) only yields dangerous kel^\pm 's and KEL^\pm 's. Such negative NO^\pm 's and VF^\pm 's are depicted in the lower half of Figure 4 and have resulted in irreplaceable results to the societies, cultures and nations. Great many examples exist from the past. Some examples of the negative noun object are the missile bombers from aviation industry, artilleries from the defense projects, nerve gas from offensive national projects, corrupted agencies from the military industrial complex (MIC), corrupt politicians from political campaigns, etc. These negative noun objects initiate negative verb functions such as wars, (LBJ (Vietnam war), Bush (Iraq offensive), Obama (Libya invasion)); legalized sale of cigarettes a few decades back, vaps, intoxications, (even to minors till a few years back) that has brought disastrous results to public welfare, societies, cultures and nations.

To exaggerate the ill effects of negative verb functions (vf^\pm 's and VF^\pm 's) of individuals and organizations (no^\pm 's and NO^\pm 's), many profiteering organizations will share their illicit profits with similar (no^\pm 's and NO^\pm 's), invest and fund in these undesirable activities. For example, the openly operating sex agencies bring immorality in societies, illegal human trafficking, child molestations, spam, and junk calls, etc. It is necessary to note that human tendencies favor the down more easily toward actions and verb functions (vf^\pm 's and VF^\pm 's) than to think and move towards pristine (vf^+ 's and VF^+ 's). In the recent past, work ethics are being replaced by the practice of illegal acts. Under the cover of deceit, the commoners practice illegality and follow the examples of the corrupted political leaders [11].

5.3 Energy Centric Cells to Drive Knowledge Centric *Kels*

Energy is the prime mover of knowledge between knowledge centric objects (small kco 's like microbes and humans, to large KCO 's like planets and galactic universes). These kco 's dominate the knowledge space. The energy to transmit and receive signals is furnished largely by the $kcos$, but any source of energy can force-initiate the signals. Hence there is closed and intertwined relation between cells and *kels*. Since both signals have finite life span, time enters the pathways of *kels* provided there is or has been some form of cells to transmit/receive the *kels* and establish an knowledge path. The intricacy of this relation is shown in Figure 4.



5.3.1 Roles of Cells

Cells carry energy over and across most energy, social and cultural barriers in the energy space. Both adhere to transmission theory well documented in heat flow, electrical engineering and communication systems. In the other disciplines, the effects of reversal of physical cells that carry energy can be (at least partially) reversed if the energy centric cells have a physical denomination. Thermal, electrical and chemical energies can be reversed by adjusting the relative temperatures, potentials, and catalytic processes. In the context of knowledge, the energy gets stored in the memories of objects (humans, societies, organizations, cultures, etc. or other species) and is not easily erased, except by amnesia, drugs other psychological processes, or destruction of tissue; even so the content may linger on reemerge. Energy expended during and after transitions and alteration of *kels* becomes (almost) an irreversible chemical (almost cancerous) phenomenon that lives in and dies with recipient host/recipient.

5.3.1 Roles of Kels

Kels carry knowledge across knowledge impedances in the knowledge space. The impediment to *kels* is the mostly due to the lack of organization and structure of the (human) transmitters, receptors and the social media. There is a definite lack of a social media theory as fundamental, generic and scientific as the transmission theory [12] in communication systems. However, if *kels* are defined as a systematic assembly of (noun) objects, executing (verb) functions by an intelligent convolution between the two in time domain, then the movements of *kels* can be precisely traced, tracked and documented. Reversal of *kels* is as impossible as the reversal of time in the timeframe when the *kels* were originally moved. Much like Emails can be deleted before they are delivered *kels* can be blocked before their movement is complete. This is feasible in computer-based knowledge communication systems.

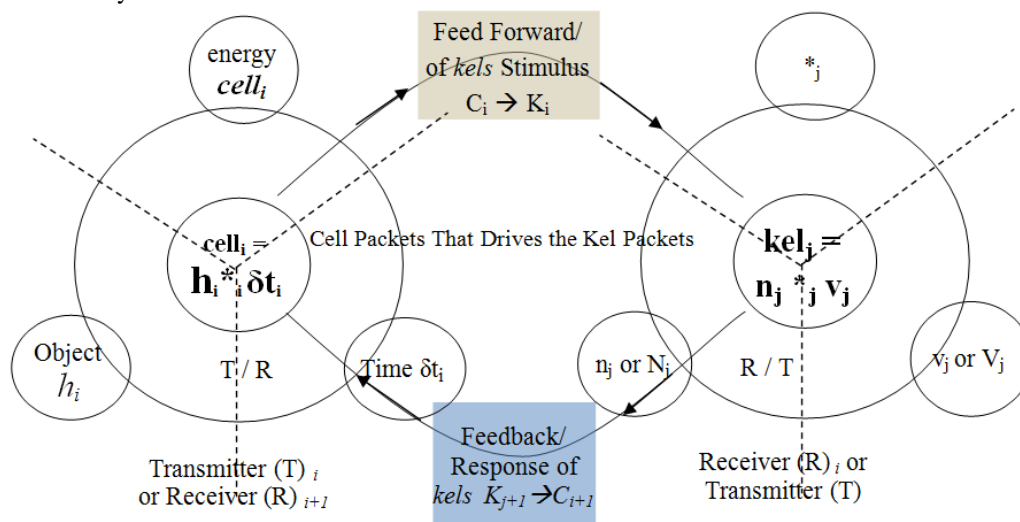


Figure 4: The Cell packets of energy (or energies) drive kel packets of knowledge from T to R. The kel a are systematically accumulated at the receiver to form a coherent body of knowledge (bok, BOK) or a larger KEL.

The process occurs for δt_i secs. This strategy is one of the standard for data

A series of exchanges constitute a body of knowledge communicated. This modus operandi id borrowed from data communication systems called the TCM [13]. Equally feasible are the other modes of data transmission such as the hybrid mode of communication [13]. The ATM “cell” communication techniques can also be implemented in knowledge transmission. The “Cell” in ATM refers to a 53 bytes cell; whereas a Cell on knowledge context refers to a burst of energy to transmit one or more groups of *kels* ($kels_i$) over a duration of δt_i (see Figure 4).

Repetitive process for the flow of *kels* occurs from T node to R node. In Figure 4, the transmitting object (h_i) on the left supplies the energy for a finite duration δt_i . A series of such cells constitutes a body of knowledge or (bok or BOK = $\sum(kels).dt$). This principle of this mode for the communication of knowledge is borrowed from Communication Theory for data transmission [12] but applied for knowledge communication theory. In this



case numerous additional processor will become necessary to identify and adapt to the principles of knowledge founded on the ($kel = n*v$) concept [14].

6. The All Present Communication of Knowledge

Knowledge and life have a genetic bondage; in fact a great many bondages. Life with all zero actions or recovery is coma. Every genetic code has a piece of knowledge (a *kel* or a *bok*) to communicate and every *kel* or *bok* has a life giving purpose to serve. Absence of all knowledge driven activities neuters life of all objects; even so neutered objects can also have a life cycle that is infinitely short to perceive (i.e., transient elements) or infinitely long (e.g., life of galactic planets, universes, etc.) to conceive. However, in everyday environment, knowledge needs to be communicated in an intelligible format and language.

6.1 The Repetitive Energy-Action Loop

In order to be complete, we present a more comprehensive diagram of a knowledge communication system to incorporate behavioral and social aspects of communication, shown in Figure 5. In essence, Figure 5 is a continuation of Figure 4 and it includes the role and origins of motivation and the energies that fuel the actions in the lives of microorganisms such as bacteria and viruses to the very large objects such as the bio-systems, planets, earths, and even galaxies. This minor loop is shown in the center of Figure 5 and serves to integrate energy with action, action with life and life with energy. This triad is universally present in all objects communicating with their environment. Zero communication with all environments is only a phobic existence of objects on its way to death.

6.2 The Energy Cycle and Organization of the Energy-Action Loop

A discipline in the cyclic processes embedded in the loop through Boxes 1 through 7 is indicative of a discipline (even if it is transitory) contributing to the art of living. Almost all functions of life and living are tallied in these seven peripheral nodes (Boxes 1 through 7) and the two inside focal nodes *Cell* and *Kel*. The energy to exist during one or the next duration is traced in the two overall cyclic (blue and red) shapes of ∞ in Figure 5. Contemplative objects in Box 7 extend and expand the size of these two sets of ∞ 's. Further, they better themselves by climbing higher and deeper in the triangular pyramids with their bases in the seven nodes. Progress of self and society both occur by the elite within and without themselves.

Fundamentally, the energy to act (and thus to live on) in Box 5, serves two purposes: (a) to gratify the need Box 1 by the verb in Box 5, in the cycle of Boxes 1 to 7, and (b) to rethink the actions in the cycle of Boxes 1 to 7. Part (b) serves the AI functions; (Pattern recognition (PR), Expert Systems (ES) and Intelligent Agents (IA, for learning, intervening, and enhancing). This function streamlines the time duration (Box 2, Figure 5) in the loop, the nature and components of each of the boxes 1 to 7. These AI components also produce knowledge elements *kels* that get accumulated in the knowledge bank for further use in similar context. This part of AI makes the organism in (7) smarter, more efficient, and more intelligent in Box 4. The process of self-improvement of the intelligent object in Boxes 7 and 1 starts here. The knowledge thus generated in two inside Focal Nodes *Cell* and *Kel* (Figure 5) is stored for future use.

The generation of *kel* gives rise to a seminal *kel*, which is added to the resident knowledge base $K = \sum (kels.dt)$ or $\int_{-\infty}^{now} (kels(t)).dt$. This knowledge base is used to perform the intelligent convolution (Box 4) and execution of the verb *v* (Box 5) to gratify the need (Box 1) that started the loop in the Boxes 1 through 7. This loop (1 through 7) is executed many millions of times as humans, species and organizations complete their life cycles. The two sets of the figures of ∞ indicate that over the learning phase the objects (n, species, cultures, etc.) can hop from one set to the other set to the other and improvise the life-styles of objects. The laws of rationality, logic and science are embedded in the cyclic processes in the universal loop 1 through 7.

6.3 Human Intelligence (HI) and Artificial Intelligence (AI) Bonded with Natural Wisdom (NW)

The execution of the functions at the seven Boxes 1-7, are intricate as human thought to be optimal in their own right. Human intelligence enhanced by Artificial Intelligence or vice versa, is very likely to get trapped in the inside (see blue shapes in Figure 6) ∞ 's due to other competing activities that also demand HI and AI from their own perspectives. However, to steer out of this entrapment in the inner ∞ 's, the approach is to balance the (time) resource between the competing activities according to microeconomic law of utilities i.e., their expected gain



from the expenditure of the time resource. The principle of allocation of resources is frequently taught in economics and management sciences

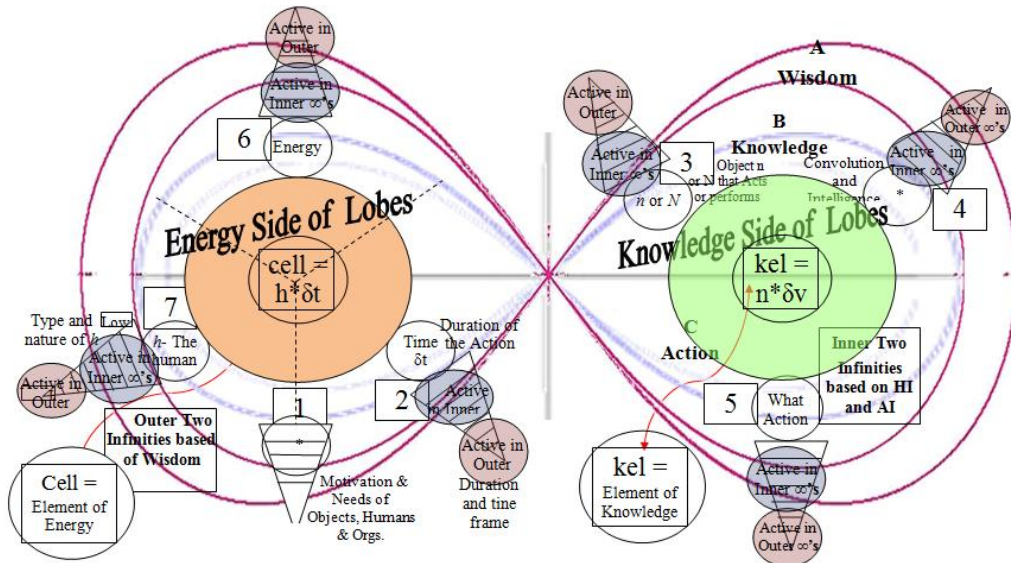


Figure 5: Balance between the Energy Resources to act and the How, When (and how long), What, by Whom the Action takes place. The Loop that is recurrent throughout the life of objects is shown as (Start-1-2-3-4-5-6-7- Repeated for the next Action at 5 that creates its own element of knowledge at the kel). Finite elements of time and verbs are represented as δt and δv . The hierarchy in the right lobe is Wisdom, Knowledge and Action is shown as A-B-C

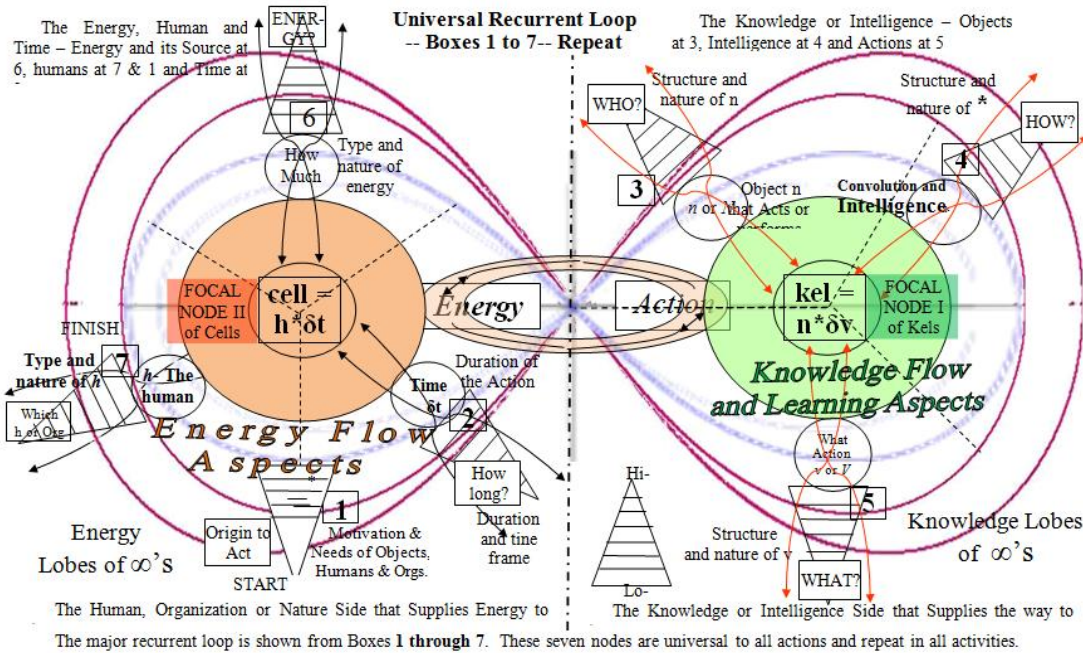


Figure 6: Diagram detailing the flow of energy (left side) and the flow of knowledge (right side) in this configuration

In the outer two sets of ∞ 's, the functions at the seven Boxes are based on an extended and prolonged duration and is most likely to be based on Wisdom (W, see Figure 2(b)), rather than mere transitory Concepts (C, see Figure 2(b)). In Internet age, wisdom bases are as readily available as information and knowledge bases. An extra increment of (Internet) effort at the two outer ∞ 's is likely to bear a monumental reward in inner two ∞ 's (see Figure 6).



7. Conclusions

The continuum and continuity between knowledge, energy and time are presented as two continuous loops 1 through 7 in this paper. The inner loops constitute the path necessary to accomplish the routine activities to gratify ever-present and all-present human needs. When contemplation and rethinking are a part of the activities (even on a delayed basis), the performance is enhanced by the wisdom loops that enclose the inner loops (1-7). Activities get efficient and optimal based on the selection and coupling of (noun) objects with the (verb) functions, they perform. The native natural and acquired artificial intelligentsias (NI and AI) are blended into the Wisdom in the Internet knowledge and wisdom bases. Social progress becomes accelerated, previous failures are circumvented and rewards are enhanced. In essence, the AI approaches warn of the prior pitfalls and their causes originating from both humans and of machines. In this approach, the presently available AI principles are deployed to detect and correct the past NI and AI failures. Effects of timing and dynamic conditions in the society are also deployed by regular updates of the knowledge *and* wisdom bases. Prior wisdom to monitor current knowledge deployed in making future decisions forces the machines to make *time-based* validations and corrections to any actions that the (noun) objects will make!

From the insights presented in this paper, we dare to predict that the machines of the next generations will generate machine waves that will permeate, enhance, modify and optimize human brain waves. We also predict that the machine will become self-correcting to withstand the tests of time from one generation to the next thus smoothing generation gaps in human culture and societies.

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