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Thought, Energy, Time and Social Confines of Knowledge

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Abstract- In this paper, three virtual but dimensioned entities are used to contain knowledge; while it is by itself abstract. Knowledge resides in knowledge-banks of computers and the Internet. More importantly, knowledge resides in all living species. The main emphasis is on the human species that construct their personalized knowledge structures and banks that they deploy to resolve their personal Needs. Such needs drive behavior and adaptive. Both these human characteristics are alive and get influence by human interaction. These dimensions have human (thought), scientific and physical (energy and time) orientations. It becomes feasible to build a hyperspace for knowledge and confine it in the three dimensions of thought (anchored in the personality of an individual), energy, and time (both anchored in both physiological and physical spaces). We present the personality aspects based on the human needs that drive the human being (a noun object, n) to perform actions (one or more verb functions v) in intelligent steps (convolutions (*)) between n's and v's) to gratify the needs. Needs are inherent in human personality to maintain life.

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Thought, Energy, Time and Social Confines of Knowledge

Syed V. Ahamed

Abstract- In this paper, three virtual but dimensioned entities are used to contain knowledge; while it is by itself abstract. Knowledge resides in knowledge-banks of computers and the Internet. More importantly, knowledge resides in all living species. The main emphasis is on the human species that construct their personalized knowledge structures and banks that they deploy to resolve their personal Needs. Such needs drive behavior and adaptive. Both these human characteristics are alive and get influence by human interaction. These dimensions have human (thought), scientific and physical (energy and time) orientations. It becomes feasible to build a hyperspace for knowledge and confine it in the three dimensions of thought (anchored in the personality of an individual), energy, and time (both anchored in both physiological and physical spaces). We present the personality aspects based on the human needs that drive the human being (a noun object, n) to perform actions (one or more verb functions v) in intelligent steps (convolutions $*$ between n 's and v 's) to gratify the needs. Needs are inherent in human personality to maintain life. Time enters the overall schema by two different venues; first, elements of time Δt 's that are necessary for n to perform v and to derive a gratification of the need; and second longer duration of time T that is involved in learning from the experience of gratification at different levels in humans, computer memories and Internet knowledge bases.

Historically, human comprehension has evolved enough to group the sequence ($n*v$) over the element of time Δt as a finite element of knowledge Δk . The connectivity between these many elements (n , v , $*$, Δt , and Δk) can now be symbolized as ($\Delta k = n*v$; during the interval, $\Delta t = t$ to $t+\Delta t$). Now it starts to become more and more feasible to track numerous Δk 's by tracking (n , v , $*$, Δt)'s and build a larger body of knowledge ($K = \sum \Delta k$'s) over a longer duration ($T = \sum \Delta t$'s). These relations are not algebraically or numerically accurate because the physical dimensions for mass, length, time, and permeability (M , L , T , and μ) were never designed to hold human personality, emotions, needs, and levels of gratification in human beings. However, the conceptual linkages are as valid as the accuracy of numerical and mathematical relationships in the physical or scientific domain. We hope that computer science, knowledge society, and the Internet age will be able to rationalize and quantify knowledge science over the next two or three decades.

Keywords: knowledge, time, human interactions, human thoughts, noun objects, verb functions, convolutions, knowledge and time.

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I. INTRODUCTION

a) Knowledge Science as a Scientific Discipline

Knowledge can be a computational entity that can be processed as numerical, logical, and/or informational entities in computers and networks [1, 2]. The command languages and processing architectures for knowledge systems become progressively more intricate, elaborate, and structured [see Chapters 5, 6, and 7 in Reference 2]. Though, more complex knowledge processing systems can be construed and built dependably as the knowledge bases and knowledge management systems now distributed throughout the Internet and knowledge web sites. Even though such knowledge systems do not function as precisely, accurately and dependably as the more established computer systems, they perform more precisely, more accurately and more dependably than the human counterparts who also process knowledge to find one or more solutions to the real problems in life and society.

A framework of measuring, quantifying, and predicting knowledge in any particular direction defined by the Dewey Decimal Systems or the Library of Congress classification is presented in Reference [3]. Such knowledge-centric objects (*KCOs*, see footnote 1, Section 1.2) can indeed be constructed in the memory systems of computers. These *KCOs* have volatile and dynamic boundaries that couple with the human mind/psyche or with other *KCOs* to image the reality of the physical space. The attributes and bondage of the *KCOs* are altered by the knowledge systems much as the numerical values and their dependencies are altered by the CPUs and programs of computers.

b) Fragmentation of Knowledge

Elements of knowledge (shortened as *kels*¹ to represent knowledge elements) exhibit laws of chemistry

¹A series of symbols are used in the paper to build a strategy for the design of the language of knowledge and its mechanics, and constructs. Knowledge and elements of knowledge are represented as k , K , Δk , ΔK , and as *kels* or *KEL* or *KEL*'s. The symbol *bok* or *BOK* is used to denote a body of knowledge (also denoted as knowledge centric objects or *kco*'s) at an intermediate level during the processing of knowledge. These *bok*'s or *kco*'s are generally held in Knowledge Cache's in the knowledge processor unit or the KPU. The nouns objects are represented as n , n 's, no , no 's, $N1$, $N2$, NO , NO 's, etc., The actions are represented as v , v 's, vf , vf 's, $V1$, $V2$, VF , VF 's, etc. Convolutions as represented as $*$ or $*s$. The arrow (\rightarrow) represents the direction that the action is directed towards or the flow of time to

as the chemical elements bond with other elements and generate new compounds and molecules. In the domain of knowledge, the laws of convolution with other *kels* are flexible and adaptive, but maintain rationality for the mind to perceive knowledge in its microscopic or macroscopic formats in the real world and the mental space. Both the real world and mental space spans nations, cultures, and societies.

Knowledge in human activity blends like chemistry within species in nature. In most instances, larger bodies of knowledge are composed, enhanced, used, and utilized to benefit the existence of society. The fundamental precept behind all the widespread generalities is that the lives of all species are based on dynamic actions of objects that make life feasible by prolonged strings of actions continually in the time dimension. Objects and actions trigger the mind into a life-form based on the answers to seven basic questions; *why, who, what, how, when, how long, and where*. The mental coordinates are established. Information is processed and knowledge is acquired. The long cycle from prior knowledge to the derived new knowledge continues ad infinitum

The strife between good and evil is the theme of vicissitudes in lives. The inner self that refuses to accept anything but the best leads to the search for the best for each one (i.e., each noun object(s), *no* or *no's*) with honor, justice and dignity accomplishing the each one of the deeds (i.e., each verb function(s), *v* or *v's*) in a tactical and socially acceptable way (*). In a nutshell, the theme of activity becomes (*no* → * → *v*) or (*no's* → * → *v's*) in a time sequence that a machine can execute with the probabilistic result(s). The central processor unit (CPU) of such a machine follows a series of executable statements that can be written down as $\{\sum ((no \rightarrow * \rightarrow v))$ from '*t*' to '*t*+ Δt ' in real-time. The motivation (*why*) for the *no* (*who*), the (*what*) actions (*v's*) in real-time duration from '*t*' to '*t*+ Δt ' (*when* and *how long*), and a probable outcome after an interval are established.

The parameters listed above are entirely programmable as operators, operands, and operational codes, in knowledge machines. The machine emulates the actions, behaviorism, and modality. The most probable outcome is stacked away to be combined with other executable statements. The series of actions can thus be optimized for the most desirable (expected) result from any social, corporate, national, or any strategic result.

accomplish the action. Time is represented as *t*, Δt , and *T* Capitalization indicated larger entities, lower cases indicate minute or localized entities and Δ indicate elemental entities. The knowledge operations and processes are further explained in Appendix A

c) *Human Factors Involved*

i. *Syed Revise this section*

The expenditure of energy to function causes its depletion and reduces the tendency to remain active indefinitely. A sense of balance between the extra expenditure of resources and the expected gain in the marginal utility that is thus derived curtails excessive effort in any given direction. The balance becomes global and a sense of fairness and justice prompts most humans to be generous and positive based on gratification and peace. The Second Law of Microeconomics becomes the basis for the human race to progress in a positive direction.

In the other direction, when resources are limited, the conflict between self-interest and fairness starts to surface. The fears of the future sometimes dominate to obliterate the glory of being righteous in the past. Greed and negativity sets in. The first and second need levels from the Need Pyramid [4] projected into the future, cast a grim shadow over the fourth and fifth levels of need-gratifications from the past. Fear of fear makes the insecure drown in greed, hate, and violence.

The knowledge machine is more than a communications tool. It has all the potential of being an intelligent partner to interact and act as a highly logical human or a highly emotional companion. During training the machine, the machine acquires the personality of the "other" interactive human. The machine personality is augmented by internet knowledge bases that provide, validity, verification to provide answers for the saint (with positive priming of the machine functions (such as the knowledge-operation codes (*kopc's* of a KPU [5]) and connectivity to intellectual and verified KBs).

Conversely, a negatively primed machine can also provide for the mafia and thugs by connectivity to mafia and their associated knowledge bases. Also, the machine acquires the most desirable interface for the interacting human based on the "mood" of the user, just as a therapist would adjust the sessions based on the attitude of a patient. Human temperament though highly variable is accommodated by appropriate macro commands at the interface.

The two vividly different philosophies of human thought are founded on the elite processes for the social betterment by the practice of truthful, virtuous, and beautiful deeds in society one side and on the despicable processes for social contamination and its downfall. The emulation of the human behavior of the elite is feasible by positively primed Knowledge Machines (KMs) [6] and conversely, the emulation of the deceitful, arrogant, aggressive, and hate-ridden actions of the perverse groups of the population, for social erosion of established ethics and morals. Knowledge machines being mindless can address both sides of human nature and personality.

d) Dyadic Interactions And Time Lapse During Interaction

Time is of the essence in all knowledge-generating processes. An example of a two object $N1$ and $N2$ is presented in Figure 1. $N1$ initiates a verb function $V12$ directed at $N2$ with a convolution $*1$ which is responded by $N2$ directed back at $N1$ with a convolution $*2$. During this transaction, an element of knowledge ΔK_{12} is generated. Conversely, after the response, another element of knowledge ΔK_{21} is generated. A series of these exchanges generate two bodies of knowledge $bok12$ and $bok21$. A profile of relation between $N1$ towards $N2$ and conversely between $N2$ towards $N1$ gets developed and retained in the perceptions of $N1$ and $N2$ respectively. Certain social protocols and codes are embedded during the interactive process.

It can be seen that if the interaction id between two human beings $N1$ and $N2$, then the personal attributes of both are invoked. Likely primed humans interact according to the code of ethics in their way and depend on the intelligence of each.

II. BILATERAL HUMAN RELATIONS

Bilateral human relation between two individuals $N1$ and $N2$, depicted in Figure 1 is a symbolic model of

the interaction process. Both $N1$ and $N2$ have Needs to be satisfied and assets to satisfy. However, social interdependencies force most individuals into a negotiating stance (dashed lines in 1) when the needs of $N1$ may be adequately satisfied by personal assets or better satisfied by the assets of $N2$ and vice versa. Even though this computational model is symbolic and number oriented, it reveals computational cycles and the instability that can arise in real life and in the computational processes, which follows the interactive process.

Largely, in just societies, the laws of fair trade tend to equate the net worth of assets exchanged thus maintaining a framework for stable and repeated social interactions. Many variations and exploitations are possible due to ignorance, greed, or cruelty. To deploy such situations the use of the five variable $l, m, n, j,$ and k becomes appropriate. However, two such sets of variables $l_1, m_1, n_1, j_1,$ and k_1 for $N1$ and $l_2, m_2, n_2, j_2,$ and k_2 for $N2$ become necessary. Besides, any nonlinearity between the attributes of $N1$ and $N2$ also need consideration.

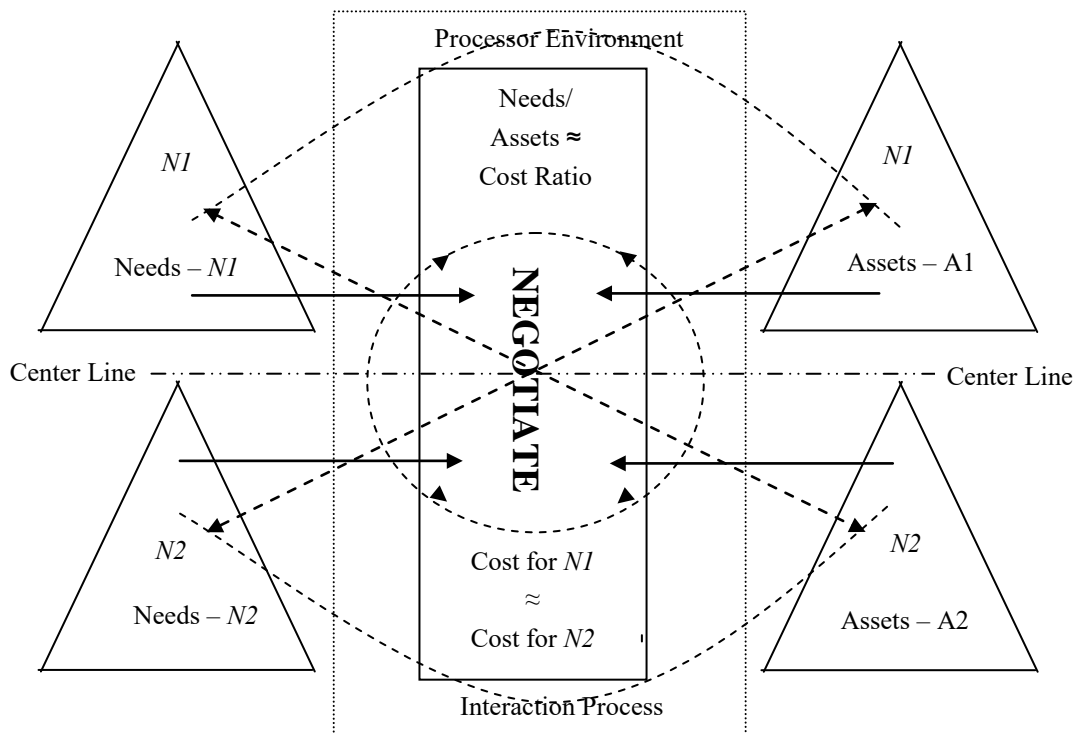


Figure 1: Depiction of a bilateral framework of relation between two intelligent objects (such as two individuals). In the knowledge processor (KPU) or machine environments the each object influences the response in a symmetric fashion. Asymmetric relations occur when one objects has power or authority (such as social position, boss, ownership of resources, etc.) over the other.

Many thousands of types of human attributes, their nature, and the numerical range of the variables and their interrelations account for the innumerable types of human interaction. The KPU of a knowledge machine is thus capable of simulating the entire spectrum ranging from an insignificant exchange of trivialities to a cruel war between nations. Figure 1 depicts a bilateral interactive model for interaction for two individuals. The role of the two individuals is reversible and the centerline of symmetry runs horizontally through the computational model. Further elaboration of this diagram results in a more comprehensive computer model presented in Figure 2.



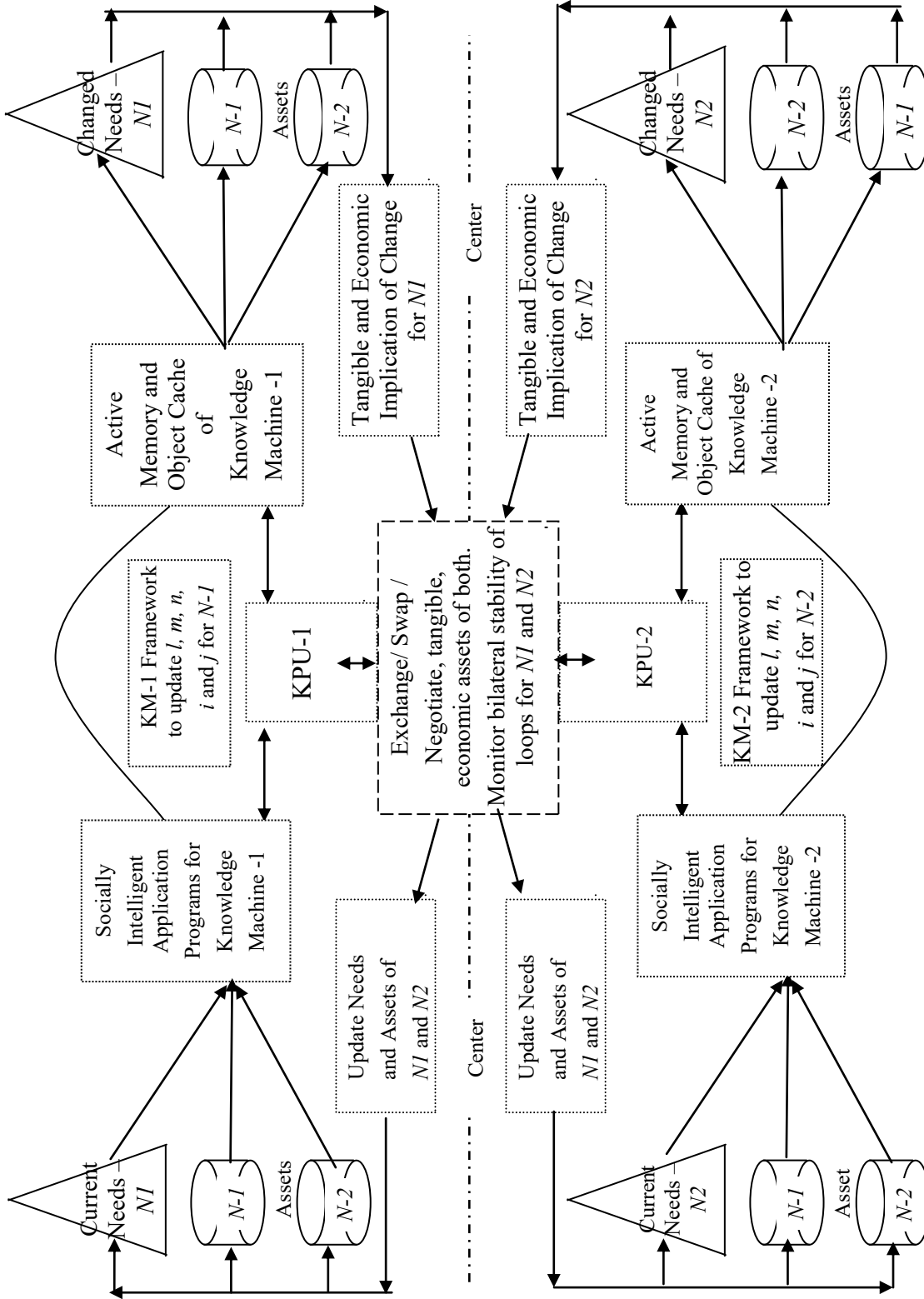


Figure 2: Schematic of Negotiation process between N1 and N2 with updates for human variations l, m, n, i and j.

a) *Human Interactions*

A systems model for human interactions ranging from interpersonal relations to Labor-Management negotiations of the nature depicted in Figures 1 and 2 are presented in References [7, 2]. Mathematical models of human interactions are presented by Roman, et al, [8, 9] and Pen [10] present the symmetric interactive processes. The nature of the interactive process is based on an economic exchange of assets offered and concessions received by both parties. Four possible outcomes predictable by the models are (1) smooth convergence to a mutually satisfactory result for the interacting parties; (2) oscillatory convergence; (3) oscillatory-divergence without any agreement resulting from the interaction; and (4) smooth convergence without an agreement. In such interactive processes, instability and oscillations result in a waste of time.

Such a framework becomes applicable as (intelligent) objects undergo a process in the KPU environment of the KMs. The oscillations can take on numerous forms in the intelligent object behavior. On the one hand, the response can object over/under reaction, out of context responses to certain verb functions (VF), yet on the other hand, the response can be opposite of that expected for any predefined VF . Rational or irrational behavior is feasible thus invoking two (logical or illogical) reactions from the other party. Briefly, the rational-logical interactive mode leads to a convergent and sensible interaction, while irrational-illogical mode leads to the most severe (even destructive) oscillations and/or divergent interactions.

The control of such oscillations lies in the predictive capabilities of each/both parties to the final and desirable goals for both parties. In essence, the mechanics of the systematic processes of interaction between intelligent objects, in reality, is portrayed by the status of the objects and their attributes in the knowledge machines. Intelligent objects and knowledge machine would be able to function at two levels. Level-1 functions monitor the progress towards the achievement of goals in a mutually beneficial fashion, whereas level-2 functions track the stability of the negotiating process and monitor the status of the objects and their attributes from becoming, divergent, explosive, and mutually exclusive. The KPU [5] thus functions at an "intellectual" level (level-1 functions) and an "emotional" level (level-2 functions).

In abused knowledge machine, psychotic and abnormal behavior of intelligent objects is forced by implanting oscillatory and abrupt changes in the values of l , m , n , j , and k , for evaluating the response(s) of the object(s). Bilateral instability in the parameter (l , m , n , j , and k) values is likely to be a cause for conflict, confrontation. A series of violent and turbulent changes can only lead to war and destruction.

III. BASIC TRUISMS FOR NEEDS, SATISFACTION, AND ENERGY

Knowledge science methodology can be implemented by novel computer architectures. It was conceived and presented [6] as far back as 1993 and 1994. Knowledge science as a scientific discipline was presented in 2006 [11] and further expounded in 2009 [2] based on the theory of knowledge. The convergence of knowledge science, computational programming, and its machine implementation as they can be implemented in the Science of Medicine was presented in 2013 [12].

In this section, we present a matrix approach to the uneven flow of knowledge in social and cultural settings. Knowledge is always in a state of transition and flows from one or more social or a natural source(s) to one or more receptors, the delay and dispersion of knowledge are related to the media characteristics represented as a matrix. The source and receptor characteristics also play a part in the communication of one element of knowledge (symbolized as a ke). These ke 's being of any size and nature can be integrated in a coherent and cogent fashion to make microscopic or macroscopic bodies of knowledge in organized, structured, and sensible knowledge in the human minds and in addressable segments of knowledge bases in networks and on the Internet. Small and large bodies of knowledge (symbolized as $boks$) can thus be organized, reorganized; processed and reprocessed; retrieved and stored; adjusted and organized; and optimized and enhanced to suit the reality of most social and scientific settings.

When perfect knowledge is being perceived, we present nine basic questions that are logically centered around the active verbs (symbolized as vs), participating nouns (symbolized as nos), and their interrelations (symbolized as $*$ or convolutions) that constitute the pursued knowledge. In answering these questions entirely, a framework of perfect knowledge will be gained, if the answers have a scientific basis or explanation. In real-life situations, partial answers to a selected subset of these nine questions are generally sufficient to carry on a function or a dialog in a pragmatic sense. Answers to one or two of the nine questions do not present significant, useful, or pertinent knowledge and such answers generally degrade the quality of knowledge. The methodology and frame-work are presented in detail to expand and to enhance the pursued knowledge to a targeted goal, even though it may not by an optimum or a perfect goal.

Knowledge has been an integral part of all life forms since millennia. Modern machines offer new tools and technologies to use and reuse knowledge in ever-expanding ways. Their positive deployment has helped human progress as much as its abuse has caused

wars, destruction, and social stagnation. In hindsight, abuse has always retarded the flow towards the betterment of society. Numerous social scientists have highlighted the cause and effect relationship of the social forces on the human inertia to the toil make building elegant knowledge and social environments.

A universal platform for the integration of social science is desirable to make knowledge a science and then to use the computer, network, and Internet technologies to accelerate the positive social movement despite the social resistance by reason and methodology, rather than by force and violence. The positive conserves human energy and offers more lasting solutions.

In this vein, we suggest the use of machines that can serve as computer-aided knowledge systems that handle the rationale and logistics beside the deployment of constructive knowledge. A mathematical framework is also proposed that can formulate the basis of discovering knowledge behind the obvious information to make the proposed solutions enduring and sustainable. Longer-lasting stable solutions to most knowledge-based problems make the investment in knowledge science attractive.

The delay in social media cannot be undone, and all communication systems suffer from the setback. Delay in social and human communications systems can be very long slowly depriving the utility of the original knowledge. In some cases when the original knowledge is based on extreme truisms, immortal beauty, and/or universal virtue, the knowledge itself assumes a flavor of immortality. For example, Boolean algebra, Tesla's conception of rotating electromagnetic fields in polyphase motors, Rumi's verses, Buddha's teachings carry their validity, appeal, and integrity after many centuries. The converse statement is equally true; e.g., Bush's lies about the weapons of mass destruction (WMD) in Iraq followed by Tony Blair's acts of a war based on falsehood; Vietcong's brutalities and Ku Klux Klan's assertion of white supremacy have all brought unwarranted disarray into the world. The matrix of communication is frail, time-dependent, and it can materially change the contents of any body of knowledge (*BOK* or *bok*). Knowledge machines deserve to be made secure against the abuse by manipulative folks!.

The emotional and value of knowledge content becomes dependent on the Social (S) Media matrix that can drastically alter received signals. Then this matrix is tuned with average transmitter (e.g., a newscaster), average unbiased media channel (e.g., a university broadcast system), and an average unbiased receptor (e.g., a typical college student), then the chances are that the received signal is a faithful replica of the transmitted signal. But this situation is hypothetical and in reality, every received element of knowledge gets

tainted to some extent other. However, in the vast majority of cases, the receivers generally get enough coherent knowledge to exchange ideas in human dialogs.

a) *Complete Knowledge*

Knowledge at any stage is imperfect; imperfect and incomplete may be, it still conveys necessary information to abide by the laws to survive, live, and even progress by controlled measure(s) over finite durations of time. In a limited sense, order and organization appear to dominate what is known in answers to a set of logical questions about anything, any time anywhere and in any social and cultural context. The saving grace lies in refraining from asking the question(s) that intellect cannot resolve and the mind cannot perceive. Human and mental resources are constrained, if resources are not the limit, life-span is.

In a very rational way, one can seek the answers to *Why? What? How? Who? Where? When? Duration* (or how long?) for any element of knowledge, only to be frustrated that innate and unrestrained curiosity has no logical or rational end. A combination of these questions posed together will only cause more frustration for the mind and disarray in the thoughts. When appropriately constrained, the answers to these questions lead to well structured and duly ordered solutions to many scientific and social problems. Given any body of knowledge about anything, an intelligent human or machine can query in at least seven different ways (each by itself or in combination(s)) repeatedly to reach the frail edge of what is known.

In the knowledge domain, where every microscopic element of knowledge rests in a noun object, a verb function to and from other noun objects, inappropriate convolutions, has no immunity from these questions. However, this quest leads to a few guideposts. The answers to at least some of the questions form a stable neural net in the brain to encompass a noun-object, a verb-function, or a convolution in their rights that can form linkage to such other cluster(s) and the neural net can grow larger and larger and become more and more stable. If the answers are derives based on science, truisms, social benefits, and economic principles, then the borders of rationality are pushed deeper and deeper in the neural nets in the brain; the personality becomes stable and larger tasks (verb-functions) can be accomplished more effectively and more efficiently with larger and larger noun-objects in a refined and orderly fashion.

In a gross and macroscopic form, the fundamental question (*Why?*) and its answer lead to life itself: since every living member of every species has to sustain its life form, all energies stem from this essential requirement. Physical, psychological, social, intellectual, etc., venues have been carved out for the orderly flow of

these energies over the eons of existence. More recently, computers and networks have altered the flow and storage of knowledge that permits the channeling of these energies in optimal and efficient ways to achieve sets of goals and ambitions. The role of the new advances in technologies become crucial in finding innovations, sciences, and technologies to help mankind a more elated and more civil way to live and exist with nature without destroying it.

In most environments, searching for the answers to the seven basic questions leads to objects and things; their actions and accomplishments; and how these objects do what they have to do or what they have done. Knowledge starts here! Embedded in related objects, actions, and how they blend. Stated more precisely, every module or element of knowledge (*kel*) is founded in one or more noun-objects, one or more verb-functions, and their respective convolutions.

Table 1: Seven Logical Questions and Their Implications in the Machine and Network Environments

Question/Partial Answers	Machine and Network Response	Objects (machines), Actions (execute), and Appropriate Convolutions (programs)
1. Why? Simply to 2. continue life form 3. What? Computer 4. Systems 5. How? Procedures 6. and Creativity 7. Who? HW, 8. Know. Machines 9. Where? (x, y, z), 10. (r, θ , ϕ), etc. 11. When? Past, 12. present or future 't' 13. Duration? ' Δ '	1. To Generate, Examine, 2. Manipulate, etc. 3. Computers, Robots, Systems, 4. Networks 5. Computer and Machine 6. Aided, Robotic Systems 7. Machine and Knowledge 8. Systems 9. Controlled or Open space 10. environments 11. During execution or Real time, 12. Extended time apps. 13. Execution, loopback, Internet 14. Response time, etc.	Solutions and resolve (routine and special) problems; Information, logical, business, social, etc., issues Application and scientific programs; Procedures, OS SW, HW/SW/FW/structures Design and Derive general instructions for machines, their repetitive patterns, protocol, and OSI instructions, etc. HW and machine, corporate, cultural configurations, etc. Local machine, and (LANs, WANs, global, etc.) network and INTERNET Execution-phase time Line, start to end, discrete, or continuous-time setting Execution time for machines, network process time to execute Internet and machine instructions

When knowledge elements are broken down into their building blocks, machines become invaluable in reaching targeted goals of speed, efficiency, and accuracy. Computers, networks, and digital systems in the knowledge era have the innate ability to handle knowledge at its lowest to its highest levels in three distinctive ways as follows:

- i. Machines can and do grip and load the noun objects (*no*'s) from their very rudimentary form as cellular and microscopic objects to large bodies of knowledge as (*BOKs* such as books, knowledge bases (KBs), tables, series, texts, etc., as operands by bringing them (or their address(es)) to the Operand Registers (ORs).
- ii. Machines have the innate ability to construct and construe verb functions (*vs*) from nano-, micro-,

mid-sized to macro, to cosmic processes, etc., as operation code by hardware, micro-programmable, or macro programmable codes by bringing them (or their address(es)) to the Instruction Registers (IRs).

- iii. Machines have the innate ability to lookup a context-dependent table that selects the appropriate convolution (or a set of convolutions) to combine one or more elements of knowledge or *kel*(s) and assemble a series of context-dependent microinstructions. Machines move the result of it's (address(es)) to the output register(s) or (ORs).

All the software tools and methodologies currently used in computer engineering become applicable in the knowledge domain as knowledge-ware tools and methodologies in building and designing major knowledge-ware systems. We present the

conceptual bridge between computer sciences and knowledge science in Table 1

b) *Human, Social and Computational Environments*

In human environments, the search for answers to the seven basic questions (Why?, What?, How?, Who?, Where?, When?, and Duration (or how long?)) leads to pursuit of (social) knowledge. In the computational environments, the search and the continued nature of these answers in the real-time leads to noun-objects, verb-functions, and their convolutions that have significance to the processes and communications of knowledge elements. Typical answers to these questions in the human and social domain as they relate to the computational domain are presented in Table II.

Table II: Seven Logical Questions and Their Implications in the Current Social and Human Environments

Question/Partial	Answers Human and Social Entities	Objects (entities), Actions (perform) and Appropriate, Orderly and Organized (functions)
1. Why? Support of	1. To support & gratify the	1. Basic Needs: Freud (3-Layer), Maslow (5-Layer), Ahamed
2. Life Functions.	2. Needs to live and excel	2. (7-Layer), (Carl Jung, Marx and Mead, Smith, Keynes)
3. What? All forms	3. All communication and	3. Preloaded or Down Loaded Programs in Devices that
4. of Digital Systems	4. computing interfaces	4. follow scientific, social, search, and their algorithms.
5. How? Procedures	5. Clicks and/or Operation of the devices and Gadgets	5. Learn and Use the preloaded programs in social and communication devices.
6. Creativity.	6. Generally, Self or Partnering	6. Human(s) and organization(s) partnering with other social entities are involved
7. Who? Handheld	7. Individual or organization	7. Distance is generally not an issue because of the network/Internet connectivity
8. Know. Systems	8. The current location is generally implied	8. This is the situation and problem-dependent parameter
9. Where? (x, y, z)	9. Present (Now) emphasized	9. Execution times for the devices and transit times in the network or Internet and to complete transactions.
10. 't' (Spatial), etc.	10. (Again and again)	
11. When? Past, Present, or Future 't'	11. As Fast as Possible (Again and again)	
12. Duration? 'Δt'		

Overall Theme: Begin Start → Restart → Execute → Monitor End → Continue/Finish → Prolong

IV. KNOWLEDGE-BASED ON ACTIONS (N*V)

Knowledge is derived from the gratification of needs of objects (n's). Such needs fulfilled by one or more actions (v's). Incremental knowledge gained by the process (n*v) is arranged and accumulated in the neural nets of the object(s). It is then-onwards intelligently (*) used, reused, modified, enhanced, customized, etc., by objects (including machines and knowledge processors) by being more productive and optimal. Further knowledge exhibits exponential growth; and bears a signature(s) of the factors deployed in the deriving the ensuing knowledge. This axiomatic truth is eternal for every object from microbiological to planetary

c) *EBB And Flow of Knowledge*

The velocity of the flow of knowledge is as variable and dynamic as life itself. Static knowledge is no knowledge; instead, it is indicative of a coma-static mind and body of any object or entity. More ever, the velocity is neither uniform in time or space. Hence, the velocity of flow of objects, the rate of flow of activities, and the rate of change of their convolutions all play a role in the flow. Objects and their activities are equally important in all aspects of social and machine tasks. The pattern of the ebb and flow of verb functions, noun objects, and their convolutions can have a commonality in their flow and they are rarely synchronized.

cosmic entities. It is yet to be confirmed if this axiom is true for virtual objects after verifying if objects can be virtual!

Any object without any need to sustain itself does not need any knowledge. Conversely, since all objects have some definable form or structure, some extent of knowledge in inherent or embedded within its structure. As an extension, the higher the needs and or their structure more knowledge and its structure are embedded or learned to sustain the structure. In an extreme case, virtual objects have linkages to others that define and reinforce their structure. Infinitely virtual objects may not have structure, but that becomes a philosophical issue.

a) Simplest $N \rightarrow V$, ($N \rightarrow V$) Knowledge

For all species, certain actions are necessary to gratify one or more outstanding or deficit needs at any instant of time. These actions depend on thought, energy, time (TET), and social constraints for the entity

(n or no , n 's or no 's) enacting the verb function(s) (V , or vf , v 's or vf 's). The role of the intellect becomes evident in the choice and convolution *'s of v 's (i.e. $*v$) concerning its optimal gratification of the deficit need(s). Thus, process $n \rightarrow v$ becomes very personalized.



Figure 3 a: A noun object (n) acts (v) or invokes an act for Δt secs to gratify its deficit need. The need is extinguished by traversing the loop (A certain amount of hysteresis is implied in the forward and backward loops from n to v and back from v to n). This loop consumes some energy E and this comes from the TET effort on the part of n .

b) General Structure Of Dyadic Interactions

Interactions constitute relations of species and social entity without any interaction (whatever) is a lifeless social unknown black hole. In a traditional environment of everyday life in the current Internet Age, a scientific basis becomes essential to be precise and computational, the interaction needs a framework and a blueprint even though the format may be violated on many occasions, there a basic theme that can be formally programmed for social machines. The computational space follows this pattern in time dimension thus following space-time coordinates in the memories, processors, and peripherals of the social machines. This space can be traversed, reversed, and optimized for efficient replicas of social interactions, even though social interactions in the real and neural spaces are irreversible in the time dimension. Numerous representations may exist and depend on the type and nature of the interaction. The type of convolution is also contextual and differentiated as $*12$ or $*21$ Typical of these interactions are presented as follows:

$$(n \rightarrow v \text{ and } (v \rightarrow n); n \leftrightarrow v \text{ and } v \leftrightarrow n)$$

$$(n \rightarrow * \rightarrow v) \text{ or } (n('s) *'s \rightarrow v(s))$$

$$\{\sum ((n \rightarrow * \rightarrow v)) \text{ from } 't' \text{ to } 't+\Delta t'$$

$n1 * \rightarrow *v12 \rightarrow n2$ from $n1$ to $n2$ as action/reaction, and an element of knowledge ($\Delta K12$) is generated after a finite element of time Δt

$n2 * \rightarrow *v21 \rightarrow n1$ from $n2$ to $n1$ as reaction/action, and an element of knowledge ($\Delta K21$) is generated after a finite element of time $\Delta t'$.

In formalizing the steps of a typical dyadic social interaction, we present the following steps presented as a noun object $n1$ (or $no1$) initiates a verb function $v12$ and the mode of interaction is established as follows. This basic elementary process is represented as $(n1 * v)$. Further, broken down this process is written down as:

$$(no1 *12 v 12 \rightarrow no2); \text{ or as } (no1 * v 12 \rightarrow no2)$$

This element of any elementary transactional process is shown in Figure 3b as follows:

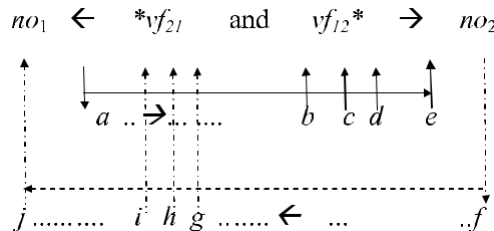


Figure 3b: Sequential diagram of a Dyadic interactions ($no1 *12 v 12 \rightarrow no2$); or as $(no1 * v 12 \rightarrow no2)$ or $(n1 *12 v 12 \rightarrow n2)$; or as $(n1 * v 12 \rightarrow n2)$. Note that noun objects can be represented as no 's or n 's.



A forward process (full lines) with *a* through *e* steps is followed by a backward process (dashed lines) with *f* through *j* steps. This elemental transaction is repeated many times to depict an entire interaction between any two noun objects *n1* and *n2*.

A computation diagram of the interactive elemental process is depicted in Figure 3c. The dyadic nature of the process is embedded in the symmetry of the diagram. Nature and the interaction can vary indefinitely in real-time making human behavior unpredictable but the machine can guide the verb functions (*v*'s) goal-oriented and intelligent (*) when the personal profile of both participants is known or estimated. The case is similar to that of an embedded intelligent agent (IA) making the appropriate changes toward achieving the desired goal. Such adjustments are proposed by Drucker [13] in the Practice of Management of corporations.

c) *Dyadic Interaction-based Knowledge Generation Processes based on $V*N, (N1 * V12 \rightarrow N2), (N2 * V21 \rightarrow N1)$,*

Actions are undertaken to gratify any need of an individual (*n₁*) to affect the need that supplied the motivation to act (*V12*). It may also involve a reaction from another individual (*n₂*). A dialog is thus started. Positive actions gratify, null actions spend energy but do not gratify, and negative actions further enhance or intensify the need. Hence the effect of social action-reaction also starts to have special features. When the secondary object, *N₂* is a machine, network, or a computer, the natural intelligence of *N₁* and the Artificial intelligence embedded/programmed in *N₂* are invoked.

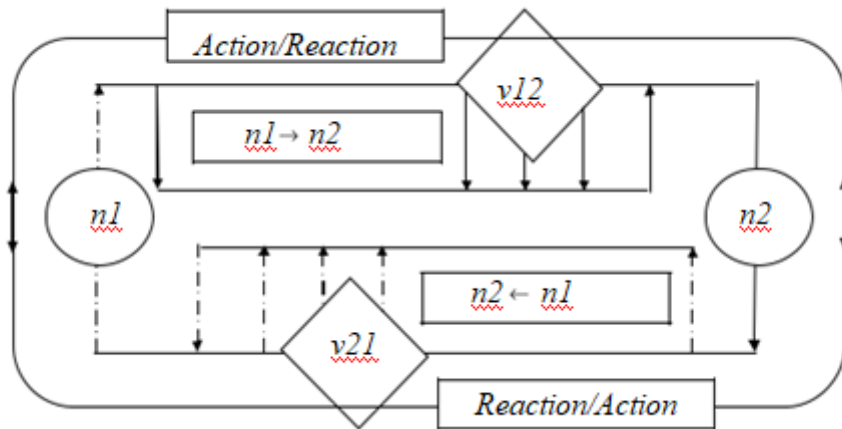


Figure 3 c: Computational Representation of a Dyadic interactions ($n1 * v12 \rightarrow n2$); or as ($n1 * v12 \rightarrow n2$)

Convolutions (*'s) form the intelligent linkages between Nouns (*N*'s) and the Verbs (*V*'s or action). Thus the symbols *N*V* becomes an element within (Δk). In general, convolutions (*'s) i., e., the intelligence of the individual deployed in combining the *ith* need with the *jth* action of the individual play a dominant role in the outcome. However, these actions are circumstantial and dynamic. They are alive and individual adding attributes the personality. Integrated over a population in a culture or society, these distributions become significant in defining their response. Derived knowledge now starts to assume a statistical distribution with a mean and variance. When different needs have different intensities of need, then positive, null, or negative intelligentsia deployed over a period from '*t*' to '*t*+ Δt ' seconds will have negative, zero, or positive effects on the need intensities.

d) *Timing and Sequencing and Structuring of Knowledge*

An accurate mathematical simulation of human interactions is not as practical as much as corporate

management is not entirely an accounting program. However, when management and accounting are intertwined the Practice of Management is a practical methodology to control corporations. Whereas accounting, production, and inventory controls are numerical, the human aspect in management still defies numerical analysis. Behavior and control may not be entirely numerical but it supports human relations to be goal-oriented and optimal and remains in the confines of allocated limits of time and be within the accepted norms of the society. These concepts are presented to enhance and guide the human aspects. The role of understanding and knowledge is vital and necessary to prevent humans from becoming robots and to prevent robots from becoming humans. In the intermediate stages, the machines can be built to be humanistic [14] as much as humans can be mechanistic [15] during the Industrial Revolution.

The current semiconductor chipmakers and technologies are unable to manufacture the VLSI chips to embed the necessary IA tools and make the timing

and sequencing numerical and entirely precise. The human touch is left open, beautiful, and almost mystic beyond the reach of numbers and fractions.

V. ROLE OF KNOWLEDGE IN HUMAN INTERACTIONS AND VICE VERSA

a) Media, Social Setting And Knowledge During Interactions

The interpretation, deduction, and construction of elements of knowledge ΔK and $\Delta \Delta K$ are depicted in Figure 4 when two noun objects $n1$ and $n2$ interact to gratify their needs and to the benefit of themselves and the benefit of each other. The depiction has two additional parameters Γ_{12} and Γ_{21} to incorporate the media characteristics². The media effects can be reduced to some extent by the receptor but with an additional effort, time, and energy. In a majority of cases, the distortions are uncorrected and the verb functions (v 's) are misconceived.

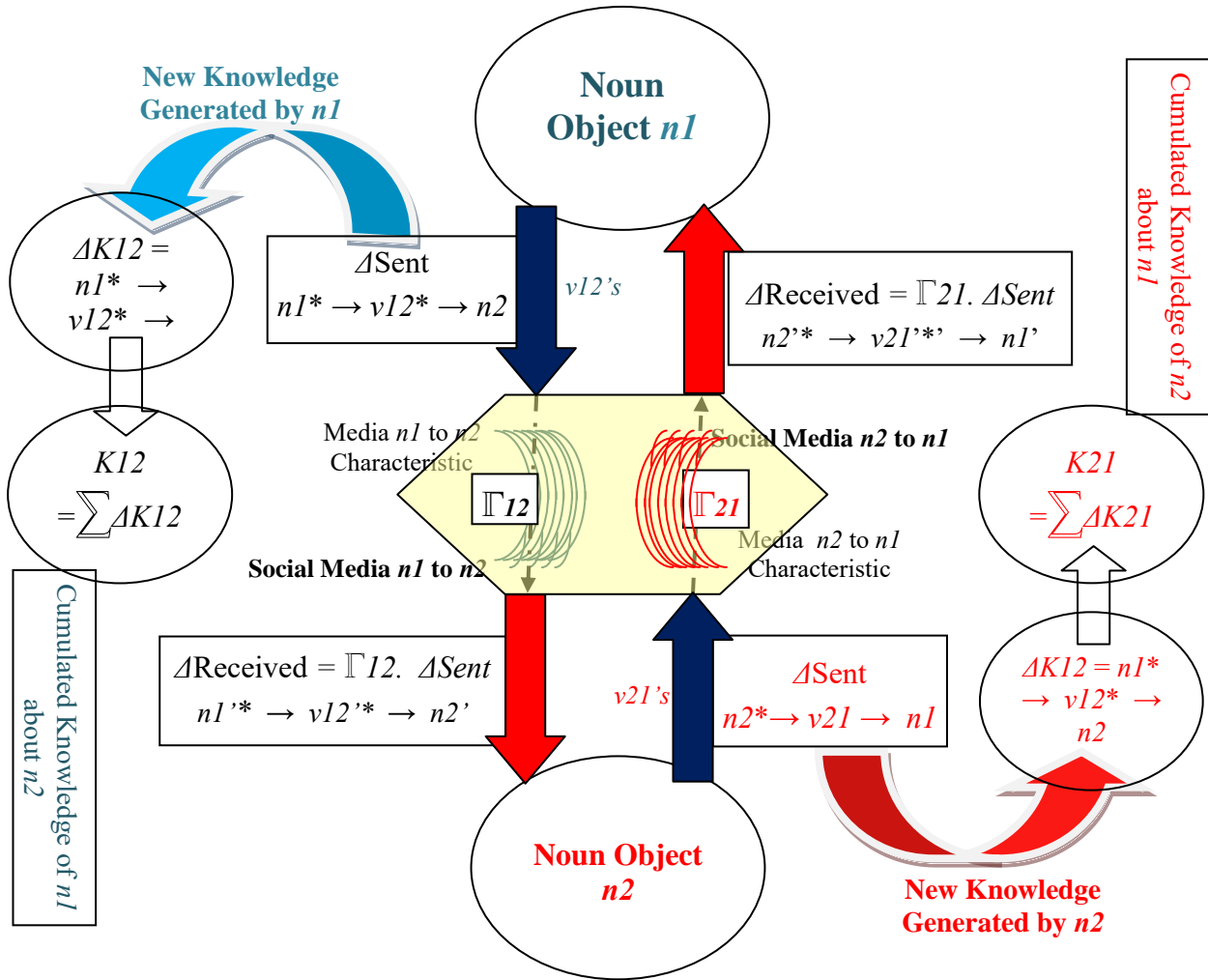


Figure 4: A Complete representation of Dyadic Interaction between $n.1$ and $n2$. Blue color is for $n1$ and Red for $n2$. The Media box has its own transmission characteristic for the flow of the increments of knowledge $\Delta K12$ $\Delta K21$. So the knowledge sent for each of the increments is not the same as what was received. This occurs because of the differences in the personalities of $n1$ and $n2$, the media characteristics, and the instants of transmission and reception. Miscommunications can thus be programmed in this model. Each of the participating objects evaluates the numerous elements ($\Delta K12$ and $\Delta K21$) received and as $K12$ and $K21$. These knowledge profiles help navigate next dyadic session to improve the efficacy of communication or alter the quality of relationship.

²These characteristics include the effects that the Media can attenuate and distort human actions and their characteristics. This situation is a vivid reality in audio and video interactions. In reality, the media change the context, the intent and purpose of human interactions. Political and personal gains are accomplished in the current knowledge era and the Internet age.

The misconceptions in many cases lead to misalignment of the thought processes of both $n1$ and $n2$ and are a major cause for confusion and conflicts. A reason for disharmony and disarray is implanted. In most cases, the damaged relations occur because of the selfish interest of $n1$ and/or $n2$ by willful or coincidental events to cause a rift. Actions are not always retrievable and cause permanent changes in the boundaries of humans, societies, generations, and even nations. Welcome partnerships and global wars are possible depending on the leadership role of $n1$ and/or $n2$. It becomes particularly important that the cooperative or conflicting noun objects $n1$ and $n2$ be perceptive of the verb functions or $v21$'s and $v12$'s consistent with the flow of dyadic interactions. Such goal-oriented clues can be programmed by computer systems even though the effectiveness can not

accurately be predicted. On a statistical basis, such computerized clues of humanist machines may be trustworthy. In dyadic human interactions, errors are rectified and the boundaries of human relations are reestablished based on prior history.

b) *Role of Economics in Human Interactions*

Economics plays an implicit role in the negotiations presented in Figures 1 and 2. Largely the benefit derived by $n1$ is approximately equal to the cost of assets expended in "buying" such benefits from $n2$ and vice versa. Social interactions have a very fuzzy outcome and results. Perceptions of either and/or both $n1$ and $n2$ play a crucial role. There are six possible scenarios and listed as follows:

a) SUCCESSFUL INTERACTION

$$\Delta W^1 \gg P^1 \text{ (viewed by } n1) \qquad \Delta W^2 \gg P^2 \text{ (viewed by } n2)$$

where ΔW^1 is the worth of the benefit received by $n1$ and P^1 is the price incurred and delivered to $n2$. Conversely, ΔW^2 is the worth of the benefit received by $n2$ and P^2 is the price incurred and delivered to $n1$

b) AGREEMENT, PERCEIVED FAIRNESS IN INTERACTION

$$\Delta W^1 \approx P^1 \text{ (viewed by } n1) \qquad \Delta W^2 \approx P^2 \text{ (viewed by } n2)$$

c) AGREEMENT, GENUINE FAIRNESS IN INTERACTION

$$\Delta W^1 \approx P^1 \approx \Delta W^2 \approx P^2$$

d) EXPLOITATION BY $n1$ IN INTERACTION

$$\Delta W^1 \gg P^1 \text{ (in actuality)} \qquad \Delta W^2 \approx P^2 \text{ (in actuality)}$$

$n2$ comprehends (from its perception that $\Delta W^1 \approx P^1$ or it has no mechanism to alter the prices. This situation occurs when there is coercion by $n1$.

e) EXPLOITATION BY $n2$ IN INTERACTION

$$\Delta W^1 \approx P^1 \text{ (in actuality)} \qquad \Delta W^2 \gg P^2 \text{ (in actuality)}$$

$n1$ comprehends (from its perception that $W^2 \approx P^2$ or it has no mechanism to alter the prices. This situation occurs when there is coercion by $n2$.

f) UNSUCCESSFUL INTERACTION

$$\Delta W^1 \ll P^1 \text{ (Estimated by } n1) \qquad \Delta W^2 \ll P^2 \text{ (Estimated by } n2)$$

c) *A Comprehensive Representation of the Role of Knowledge*

Two Figures 5a and b depict the representation of interact, negotiate and/or innovate (even love/hate) events between $n1$ and $n2$. Such an event can be as routine as a casual conversation or as crucial as a United Nations ceasefire treaty. The effects of social conditions, timing, duration, personality predispositions and media distortions, reporter biases, of the participant are duly considered and included in the two figures. Figure 5b is more inclusive and takes into account the economic balance between the 'give and take' for $n1$ and $n2$.

In Figure 5a, the Center Line of activity (all verb forms $V, v, *V, *v, \rightarrow v$'s, etc.) is at the horizontal of the center of the figure, with $n1$ and $n2$ occupying the top and bottom half of the figure respectively. All activities pass through the Central Interactive space. The entry into this space passes through two other horizontal lines to represent the media distortions, biases, and the effect of the political maneuvering and manicuring of $n1$ and $n2$ each. The arrows pointing upwards into the upper half arrive from $n2$ and pass through the transmit characteristic of $n2$ at the lower line and through the receptor characteristics of $n1$. The converse scenario exists for downward arrows from $n1$ to $n2$. This

methodology is borrowed into human communications from Transmission Line Theory and is well documented [16]. The mode of operation is full-duplex [17].

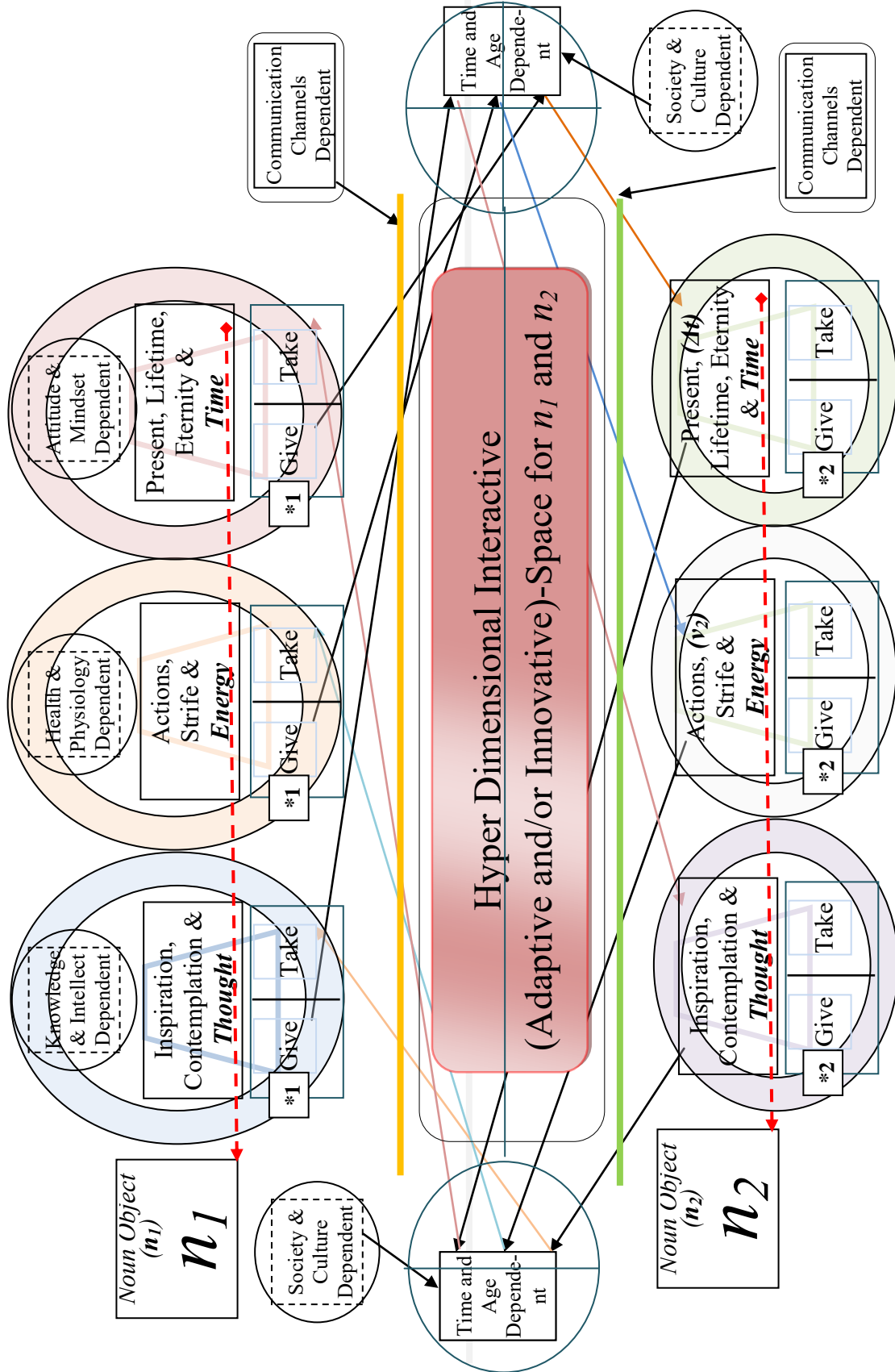


Figure 5 a: Numerous personality characteristics of n_1 and n_2 get activated during a interactive or innovative event. Typically the 'Give-Take' situation the resource for the event should be treated as 'Give' refers to 'thought, energy and time of (TET)' and the take refers to the "utility" or the worth derived from the event. An underlying economic transaction occurs and it can lead to the six outcome presented in Section 5.2.

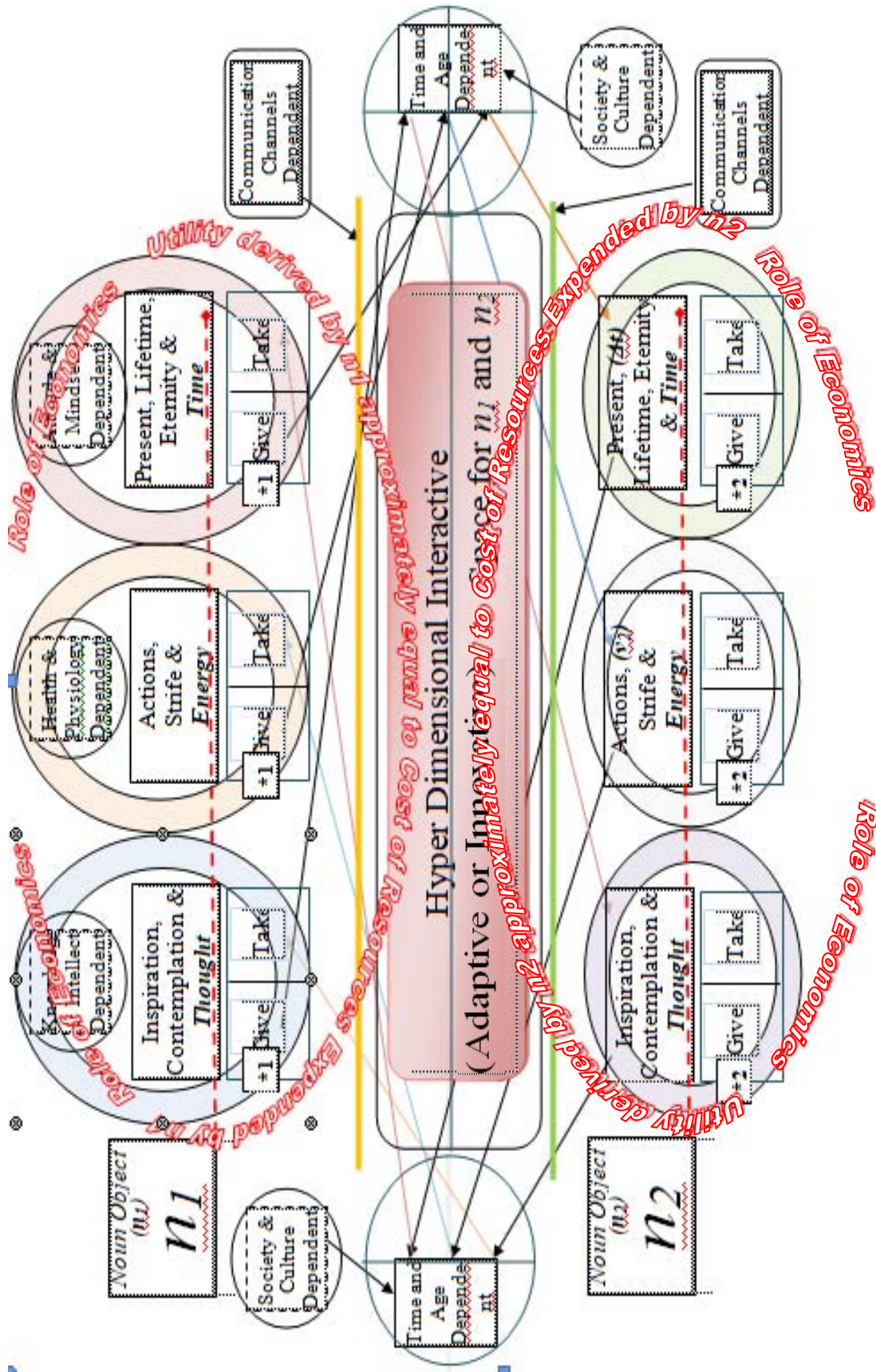


Figure 5 b: The Implicit Factors that affect social interactions between any two intelligent human objects n_1 and n_2 . In all-machine (robotic) environments, the human aspect(s) should be replaced as the embedded/programmed intelligence in the machines (robots). In human - machine interactions, the machine reacts only to extent it has been primed or by the response of intelligent agents programmed in the machine.

Reflection, reverberations, and time delays occur in all instances. All aspects of electrical and optical communication theory are applicable in human communication and the knowledge gained or lost also influenced. The human communications such effects are particularly important, especially during political events.

VI. CONCLUSIONS

A methodology and formalism are presented to deal with knowledge from a scientific perspective. The basis resides in tracing the changes in real and perceptual spaces by tracking the causes for their changes initiated by Nature, all life forms, and by machines. The methodology is symbolic and systematic, though not an entirely numerical. On a localized basis, the driving forces and the extent of change in the structure of knowledge may be estimated and linked through the timing and sequence of events that lead to the completion of any event. It is emphasized by the fact that every action in an event requires a finite element of time, however small or large it may be. Time is of the essence for any event to occur and to change the ensuing structure of knowledge associated with the event.

The lineage is established in time-domain; and it is continuous. The equations for the occurrence of verbs within events are by a "cause-effect relationship" rather than a purely numerical equation. The knowledge equations are a new breed of symbolic equations and are not related precisely as the equations as they exist in physical sciences. The principles and concepts are emphasized to traverse the knowledge space initially and this paper should be read as an entry point in the science of knowledge rather than a conclusion of the discipline. The science of knowledge is like the science of management as it is applicable in most corporations. The variability in knowledge science is more widespread since every human, society, culture, and nation is a unique entity. Laws of conduct and behavior become variable but a realm of "order and ethics" exists in all most all transactions and the verb functions within the transactions.

All entities exist because of the underlying needs that drive these entities to exist and survive as objects for their respective lifespan. Eventually, all objects will deteriorate and disintegrate including knowledge objects. The mutual dependence on other entities infuses a rule of fairness and economics to maintain the balance between "give" and "take", even though such balance has been grossly violated in balance with Nature, between humans, societies, cultures, and nations. In a sense, the basis for "good" and "evil" originates in this balance. It may be unseen, but sensed in the many "spaces" within the self, mind, and society. The corners of the profile of the personality

of every entity gently float around in these spaces (see Appendix A) every time changes occur.

Highly dynamic and extremely fast knowledge transactions defy their simulations on computer systems in real-time since the CPU and KPU clocks are based on fast Cesium (Cs, atomic number 55) crystal clocks. These clocks are deployed for computer and network functions but it is doubtful if the lattice vibrations in these rare crystals can maintain the flash of genius or the retinal response of a human or an eagle eye. The AI programs and utilities that surround humanistic machines will definitively retard their simulation thus reasserting the supremacy of mind over matter and a even greater supremacy of mind over machines!

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APPENDIX A

Symbolic Representation of Knowledge Functions

A1 ARROWS

- ➔ Forward knowledge process, i.e., the effect of the prior element on the following element.
- Backward knowledge process, i.e., the effect of the following element on the prior element.
- ➔ Generates a result or results. Can also modify the following verb v or a noun n in all spaces
- ➔ -Or modifies the status in knowledge space but on the prior n or v , in knowledge spaces
- ➔ -Generates a result, or results in a verb v or a noun n , and both directions

A.2 NOUNS and Noun Objects

Nouns are objects that initiate verbs and verb functions. They affect other nouns and noun objects (including themselves). These objects are affected by such verb function. The status is altered and during the verb is active the verbs which take a finite amount of time.

n , n 's, no , no 's, $N1$, $N2$, NO , NO 's,

A.3 CONVOLUTIONS

A convolution process of interaction with n or v usually occurs between n and v or v and n that can be unidirectional (i.e., -, or ') or bidirectional (i.e., ' -) in its general form. This function of this symbol is contextual, syntactic, and semantic; and it can depend on n and/or v . The time forwardness is depicted by the direction of the arrow for the effect of the convolution as * or *'s

A.4 VERBS and Verb Functions

A verb function or simply a verb associated with n . All verbs do not interact with all nouns and vice versa. When attempted in illegal context the knowledge machine generates an error message

v , v 's, vf , vf 's, $V1$, $V2$, VF , VF 's, BoK, bok, BOK, etc.,

A.5 KNOWLEDGE ELEMENTS

$k, K, Ck, \Delta K$, and as *kels* or *KEL* or *KEL's*, bok, BoK, BOK are also bodies of knowledge that can serve as nouns depending on the context of other n 's and v 's. *kels*. One or more elements of knowledge (in the knowledge space) associated *kels* or with $(n v)$, one or more *kels*, are generated during or after the process

$KELs \leftrightarrow (n*v)$. (Italicization of n 's and v 's does not have any significance).

A.6 PROCESSES

$(n \rightarrow v \text{ and } (v \rightarrow n)); n \leftrightarrow v \text{ and } v \leftrightarrow n)$

$(n \rightarrow * \rightarrow v)$ or $(n('s) *'s \rightarrow v(s))$

$\{\sum ((n \rightarrow * \rightarrow v)) \text{ from } 't' \text{ to } 't+\Delta t'$

$n1 * \rightarrow *v12 \rightarrow n2$

$n2 * \rightarrow *v21 \rightarrow n1$

$N*V, (N \rightarrow V)$, etc.

A.7 SPACES

RS Physical and Rea lspace with $(x, y, z, t; r, \theta, \phi, t; r, \theta, h, t; \text{ etc.})$ coordinates in which reality occurs

NS Neural space for thought and comprehension; it is real space in the physiological sense

SoS Social Space for humans and *KCOs* in dealing with social problems

Memory systems space in computer and network systems for computational tools, algorithms, etc.

MS Mental space derivative from NS

PS Psychological space with emotional ties to physical or mental objects, convolutions, and verbs

KS Knowledge space(s): Subset(s) of mental space in the human mind, or superset/subset of the memory allocated for knowledge functions in knowledge machines. The main memory is thus tiered into three layers, operational or systems space, a knowledge space, and a real/simulation/application space for computing in the real physical/computational space. Human beings routinely deploy different KSs to store knowledge accumulated in different disciplines, or about totally unrelated noun objects. During solutions to knowledge-based problems, these spaces (RS and PS, RS, and SS) get interdependent and work coherently to solve knowledge-based problems or create new knowledge that can be mapped into the real-world as inventions or modifications of existing systems. Mapping back and forth from RS from and to KS are both feasible in knowledge machines as much as mapping to and back from SS to RS.

A.8 INCREMENTAL CHANGES IN THE STATUS OF N AND V

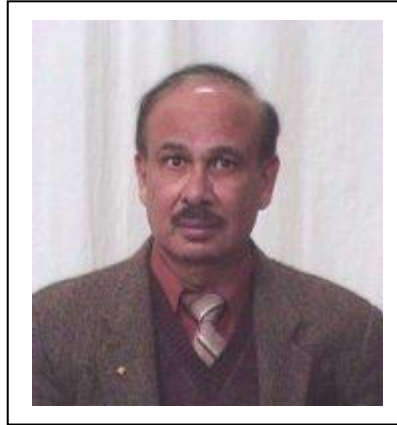
ϕ An incremental change associated with the process $(n* v)$ in the real space $RS \neq 0$, but finite however small or large it may be and equals $(n' B n; ' B ; \text{ or } v' B v)$; ϕ can be sub-microscopic or super-cosmic, where B is any verb function upon or influence.

A corresponding change associated with the process $(n v)$ in the knowledge space $KS \neq 0$, but finite however small or large it may be and corresponds to real space change $(n' B n; ' B ; \text{ or } v' B v)$; ψ can be tiny and incomprehensible or engulf the entire neural space (NS).

A.9 TIME

Time in all spaces. Reversal of $'t'$ is not possible in real space and MS but is feasible in KS, SS. Also used as a symbol in analog and continuous functions δt or t, T by undo or undelete commands on the machines. Further, the time to complete any process in the real and/or knowledge spaces is $t, \Delta t$, and T . A span of time and δt or Δt . Localized numerical operation is possible in all spaces but global reversal are impossible in any space. .

BIOGRAPHY



The author holds his Ph.D. and D. Sc. (E.E.) degrees from the University of Manchester and his MBA (Econ.) from the New York University. He taught at the University of Colorado for 2 years before joining Bell Laboratories. After 15 years of research, he returned to teaching as a Professor of Computer Science at the City University of New York. The author has been a Telecommunications consultant to Bell Communications Research, AT&T Bell Laboratories and Lucent Technologies for the last 25 years. He received numerous prizes for his papers from IEEE. He was elected a Fellow of the IEEE for his seminal contribution to the simulation and design studies of the High-speed Digital Subscriber Lines. He has authored and coauthored several books in two broad areas of intelligent AI-based broadband multimedia networks and computational framework for knowledge. His doctoral students have continued to contribute to knowledge processing systems and wisdom machines proposed by him during 1999 to 2007. In 2004, he wrote the book on Scientific Innovation, for new doctoral students based on his teaching and mentoring the best of his 20 Ph.D. students at the Graduate Center of City University of New York. Much of the innovative feedback has come from the doctoral students mentored during 1990 through 2007. He holds over 20 American and European patents ranging from slip-meters for induction motors to medical networks for hospitals.

The author is obliged to Professors Victor B. Lawrence, George S. Moschytz, Bishnu S. Atal, Nikil Jayant, Stanley Habib, Michael Kress, and Alfred Levine for reviewing the many technical books written by the author. He has continued to author technical books during 2014 and 2016. The thirty chapter book, "The Evolution of Knowledge Science," published by Morgan Kaufmann (ISBN: 9780128093559) presents a comprehensive treatment of theory and flow of knowledge in the society based on a computational and a scientific basis. In this paper, the author generalizes the ideas further and offers a methodology for the mind to explore the (semi-)infinite space of knowledge and wisdom.