Journal of Multidisciplinary Engineering Science and Technology (JMEST)
ISSN: 3159-0040
Vol. 2 Issue 5, May - 2015

Quantum Flow Theory of Knowledge (C)

Syed V. Ahamed
Professor Emeritus, Computer Science Department
City University of New York,
New York City, USA
profahmed@gmail.com

Sonya M Ahamed
Senior Research Associate, Center for Research
Columbia University, CIESIN
New York City, New York, USA
sahamed@ciesin.columbia.edu

***Abstract*— In this paper, we propose a methodology for quantifying the flow of knowledge based on simple rules of flow that govern the flow of current, heat or fluids. Knowledge being radically different from any of these established down to earth concepts starts to display that the approach based on conduction theory soon become ineffective, if not futile to be *very precise* in the quantification the flow of knowledge. However, the inroads the these discipline carved out over many decades offer a rough mapping of potentials, resistances, path impedances, work-done and energies transferred. At the outset, knowledge does not abide by universal law of conservation of energy nor by the basic laws of fluid mechanics, instead knowledge needs its own laws and precepts to quantify its flow, rate of flow, and energies transferred one knowledge centric object (KCO) to another.**

The conceptual framework evolved in this paper, together with the tools of characterization of KCOs in any given discipline offers the explanation that the knowledge potential acquired by anyone depends on the differences of knowledge potentials, the duration of interaction, and the resistance to flow of knowledge between the participants. Concepts developed here are generic and they can be used most disciplines and in most places. The paper also identifies the makeup of the "source" and the "receptor" KCOs and addresses the process of knowledge transfer wherein the constitution of the KCOs is altered and adjusted by the "work done" during the knowledge energy transfer. By adapting and enhancing equations from heat- current- or fluid-flow laws of physics, electrical engineering or fluid mechanics, we propose the knowledge flow be similarly quantified. Though simple and direct, this approach is coarse and approximate. It yields values for knowledge entities that happen at a subconscious level for human minds and for animate objects and at data- and knowledge levels in intelligent communication systems and machines.

Keywords*— *Knowledge Flow, Knowledge Centric Objects, Object-Object Communication, Kether Space, Kuanta of Knowledge

I. INTRODUCTION

Four papers [1-4] are proposed in this Journal. Part A deals with the simplest theory to quantify knowledge as we measure the current, fluid-flow, heat, magnetic fields, etc. Part B deals with flow of knowledge, as we would quantify current and voltage signals in transmission media and filters with their own characteristics in electrical communication theory. Part C deals with the flow of knowledge elements and based on the based on the *kuantum* theory where an individual *kuantum* of knowledge (a *kel*) can interact with the medium it is traversing. Finally, Part D deals with the inspirational basis for the transfer of knowledge without any media but between transmitters and receptors with matching characteristics. Part D is based on the principle that incremental knowledge is derived when one noun object interact (in any way) with other noun objects by exchanging verb functions between them in a fashion (i.e., a convolution) subject to the rules of the behavioral grammar. This Part C, also presents that knowledge can be reduced to tiny elemental cells constituted by the quantized noun objects, quantized convolutions and quantized verb functions. Most species deal with modules or *kuanta* of rudimentary knowledge in order to gratify their routine needs and acquire them to make life easier. Most elite learn to deal with and manipulate more advanced *kuanta* of sophisticated knowledge in order to gratify their special needs and learn them to satisfy their needs, environment, and their circumstances. *Kels* do indeed have a hierarchical structure. Like nature itself, knowledge exists in all textures, sizes and forms. Human senses that operate in real and physical space offer a very tiny glance of a much more intricate and sophisticated universe of knowledge that can be sensed by perception and resolved by programming and/or mathematical tools. To deal with reality and use in the knowledge era, the structure of knowledge needs careful adjustment, alignment and association, especially if it is to be deployed in computational environment.

In order to be practical and concurrently wise, we explore the quantum theory of knowledge whereby the protocol for the knowledge paths between smallest knowledge centric objects (*kco*'s) and the larger knowledge centric objects (*KCO*'s) are transported. A continuum of noun objects (*no's*), verb functions (*vf's*), and the associated convolutions (*'s) is thus retained. This continuum is searched out by segmented knowledge machines that operate between the smaller *kco*'s and the larger *KCO*'s in any given domain or direction of knowledge. Dewey Decimal System

(DDS) [5], and Library of Congress (LoC) [6], offer two established methodologies to classify the various domains of knowledge. One or more pathways exist in the chain of evolution of the subject matter and related inventions that have occurred around practical and real modules of knowledge in the range of any smaller *kco* to the larger *KCO*. All modalities of knowledge representation (images, documents, graphs, presentations, etc.) need investigation to complete the pathway(s) between *kco*'s and *KCO*'s.

Minute constituents (i.e., no's, *'s and vf's) of kels can and do interact with the social and cultural character of the medium that carries them. In a very sense, the statistical properties of the medium alters the genesis, the transmission and the retention of these kels thus offering the vast varieties of lives, decay and death of knowledge in different societies and cultures. All the principles for the transmission of knowledge presented in Part B of this four part series of papers becomes applicable in this paper. Even though human beings may be daunted by such intricacy, knowledge machine can routinely handle tracking, transmission, attenuation and dispersion of knowledge in most societies**.**

The origin of *kel* (to represent knowledge cell) is derived from the word pixel to stand for picture element (i.e., picture-cell, written as pixel). In addition, there is a resounding similarity between *kel* and the naturally elements in chemistry at the atomic, molecular and at a reactionary level. For instance, the chemical elements also consist of neutrons, positrons and electrons that play an adaptive role as the elements form molecules, and complex chains of organic, inorganic compounds, and acids. Nature has provided an innate intelligence for the world of materials to exist.

In a closely correlated methodology, *kels* also play such a complex role. *kels* can share noun objects and convolutions as much as atoms can share the nuclear elements, electrons and valency bonds. The particularly adaptive role of atoms to form varieties of compounds is evident when *kels* can arrange and rearrange their structures of *no's*, **'s* and *vf's*, to form different configurations of knowledge of chain of *kels* to form minor *kco*'s and major *KCO*'s. The analogy is evident to treat the chemical world as a type of knowledge society or culture where the *no's*, **'s* and *vf's* are the basic building blocks and these *kels* are formed and unformed depending on the dynamic social setting and the setting. At a very microscopic level, change in the chemistry of every atom is as real as the change of every *kel!*

The role of a *kel* is as fundamental as the role of seminal biological cell in all species. The two chromosome pairs formed as xx (female) and/or an xx or xy (male) chromosomes to constitute the female and male genetic cell evolves after the genetic code in the male (no_1)-kel_1 penetrates and ruptures (*vf(s)* in a distinctly unique fashion(*)) the female (no_2)-kel_2. A new kel_3 and a new no_3 (the baby) is thus formed that carries the genetic code of both no_1 and no_2 as the no_3-kel_3. One, twins, and multiple babies are all formed from the process [1] (no_1* vf_1 , also see Fig. 1). In a very oblique sense, the inception of knowledge and the origin of life get intertwined.

II. Representation of the General Format of Interactions

A. Physical and Mental Spaces

The impression of *physical space* in instilled in the human mind since inception. Estimation of distances is an inborn skill and evident as infants grab things. The dimensions in physical space are readily computable in machines. *Mental space* is acquired soon after infancy to deal with others, need-gratifying objects, environment, and self. The environment, others and the self soon start to exert influence on the reactions and responses from children and adults and as a link between self and environment is by action (or verb function) such as an infant crying/or trying to communicate because of some outstanding need. The relation of objects in the environment, others in the society with respect one's own self starts to play a part in dealing with the physical space, reality and relationships.

Mental space is dominated by objects, convolutions and verb functions. In the most rudimentary format, these three entities are constantly arranged, rearranged, formatted and reformatted to make to gratify all-pervasive human needs. Needs that initiate motivation, also supply the psychological and physical energy to find means to gratify the most outstanding need at any instant of time. However, objects, actions and the convolutions that bind the two together all play a seminal role as to how and how well the need is gratified.

In reality and perceptions, noun objects can be as large as cosmic objects and continents or as small as electrons and photons. The object size (such as a meal to gratify hunger to a cartload of grain) can vary vastly. The object type (like drinking water sip to quench the thirst to a lake to drink from) can also vary. In a similar mode, the convolution (type of action) can range (from taste, sip, gulp, nip, imbibe, slurp, to knock back, etc.) and verb function can range (from gulp down, drink, taste, to swallow or gobble). The range of variations can become too immense for the mind or machines to comprehend or process all variations, all at once. To seek a solution within the rational mind or by a programmable machine, we suggest

[1] The more precise representation of the entire set of processes is represented as $(qno_1 \leftrightarrow q^*_1 \leftrightarrow qvf \leftrightarrow q^*_2 \leftrightarrow qno_2)$ where the prefix *q* denotes a *kuantum* of the genetic code in each *kel,* Genetic sciences elaborate the processes that follow.

that the solution to any given problem specify that bounds for (*no's, *'s* and *vf's*) to a range that the mind may offer a satisfactory solution and the machines may offer an optimal (or at least a near optimal) solution. Quantization of (*no's, *'s* and *vf's*) within the range thus becomes feasible.

B. Mental and Computer Spaces

The association between (noun) objects (*who*), verb functions (*what*) and their convolutions (*how*) gets associated with needs (*why*) in the mind of infants and adults alike. The association with time (*when* and *how long*) are generally associated with now and as long as it takes. These linkages are also formed in the minds of infants since time is now and how long depends on the gratification of the need (why). The mental space forms a basis of social relations. Social objects traverse these mental spaces like clouds in the sky where some major need gratifying objects (such as parents, schools, universities, jobs, etc,) retain permanent coordinates with all six questions are answered (at least partially) in the hyper dimensional spaces in the mind. Human beings generally do not conceive social objects in precise coordinate systems, but the subconscious linkages persist in the short and long-term memories. The subconscious that provides a platform for the life, supplies the mental coordinates and working space for meaningful relations between objects (*no's*), the associated verbs (*vf's*) and the formats (*'s*) of interactions and the formats of tasks in human life in any given society and culture. *Kels* form a coherency for such tasks, as time forms a bondage between them. Knowledge and time thus get intertwined in the fabric of human activity that is tractable in the as tasks in the CPU of computer systems. Both forms of tasks need time to complete. However the silicon speed of chips being much faster, can also optimize the execution of human tasks and provide a predictive plan for human activity. In the computational domain the human beings can benefit from the intelligent peripherals of an already intelligent Internet.

Such mental associations can be reworked in computer systems like telephone numbers are worked into switching systems that provide channels of communications in networks. A scientific model becomes essential and mathematical relationships become necessary to optimize the chain of need(s), action(s), response(s) to gratify such needs. More than that, in a social setting, the socially acceptable norms play a part and culturally variable factors make the programming of social machines more demanding than the programming of plain old scientific computers based on already optimized mathematical algorithms.

III. Atom and Knowledge Element

The diagrammatic representations of a *kel* and of a Carbon[2] atom are shown in Fig. 1. Fig. 2 depicts the atoms for Gold and Hassium. These two elements have radically different properties. Atoms can and do exist in many atomic weights as much as *kels* can and do exist in many "*kel* weights" (like atomic weights) depending on the utility of the knowledge embedded in the *kel*. *Kels* can exist freely in nature (as atoms in gold), or machine generated (as atoms of Hassium). For instance the atomic weights of the noble metals is higher than one, since the energy contained in their atoms is far greater than in the hydrogen atom with an atomic weight of 1.0078, [7]). The *kel*-weight of a brain surgeon (a noun object) performing a (*vf*) transplant of the brain (if it is possible), in a very specific way (*) would be much higher than the *kel*-weight of a monkey eating peanuts. The knowledge society is thus a very ordered environment of *kels* represented and integrated as *μk's, ∂k's, ∆k's, ∑ks, ∑∑k's*, …, and then of *μK's, ∂K's, ∆K's, ∑Ks, ∑∑K's,* etc[3]. Chemistry also displays simple and complex to very, complex chains of distribution of atoms in the real world.

IV. Molecular Weights of Carbon Compounds and Larger Knowledge Elements

The behaviors of a Carbon atom and a *kel* are depicted in Figures 3 and 4. *Kels* can combine with themselves, (one or more) *kel*s, and form chains of *kels* as in human dialogs where every step in the interactive process modifies the status of the present *kel*. *Kels* retain the history of modifications like a symbol in a series of steps of mathematical derivation or like a numeric symbol in computational processing. In a sense, like human objects, *kels* have a life of their own. Sometimes they live and die in the perception of human counterparts and sometime they as real as sentences and procedures documented in textbooks.

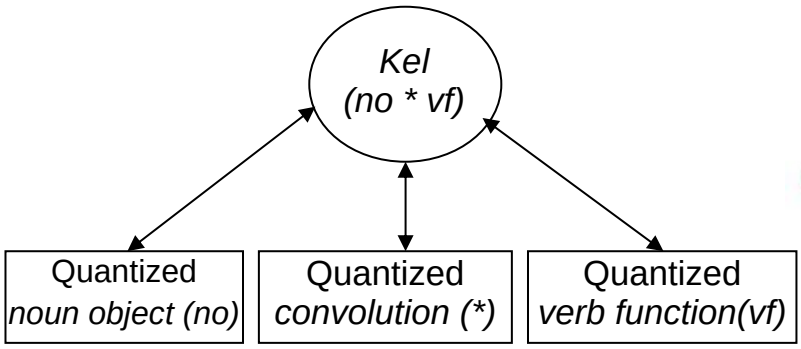
The variety of *kels* can be as large as the number of molecules and compounds in the real world. *Kels* can be as transitory as the fleeting passion or as (semi-) permanent as the written word. In most cases *kels* have a utilitarian value. This utilitarian value is indicative of the *kel*-weight. The utility if a *kel* depends on the need that it gratifies. Thus, a *kel* to represent a monkey eating peanuts would fall well below the *kel* as a programmer developing new software.

Knowledge space encompasses physical space as much as memory time spans real time and as much as

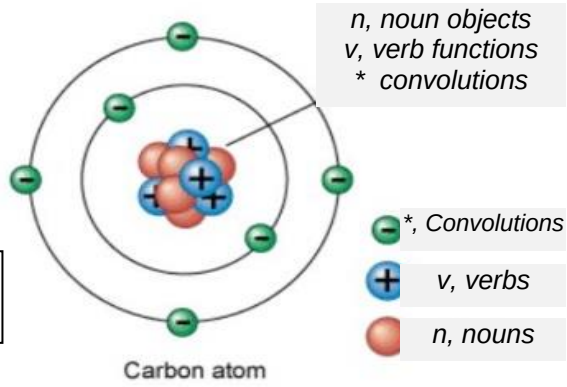
[2] Carbon atom is chosen as an example, but any element that forms molecules and compounds would exhibit similar properties and traits.

[3] In increasing order of complexity of *kels.* For example, if μk is grocery item, then μK will be a grocery store and ∑∑K would be worldwide chain of food stores, global banking corporations, etc.

perception spans cosmic time. The order of complexity of knowledge space is greatly enhanced because every noun-object, verb-function and their combination are unique to the quantum of knowledge being pursued and the human being processing it. Moreover, the psychological and mental coordinates of space and time are socially and culturally variable.

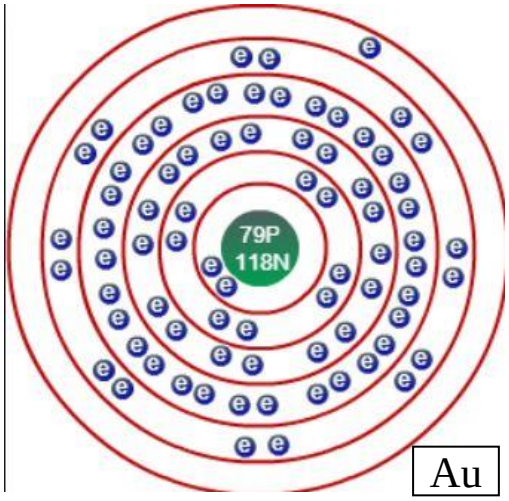


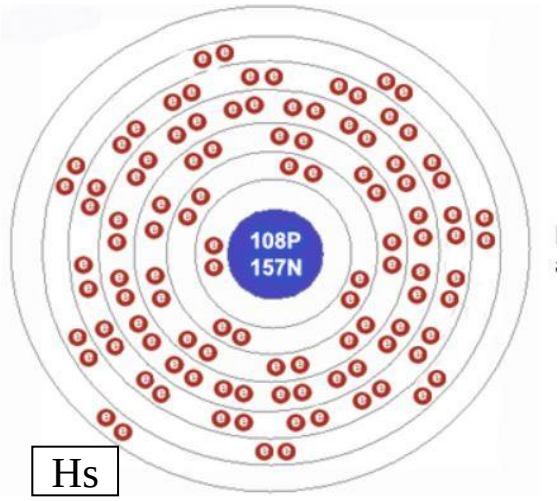
Structure of a *kel* constituted as the knowledge when a noun object *no* convolves (*) with a verb function *vf* in a specific convolution * format.



Structure of a larger *kel* with numerous *no's, vf's* and convolutions

Fig. 1. Configuration of an element of knowledge, *kel* formed from a set of the tinniest but flexible and dynamic entities (*no,* * and *vf*). The *kels* become comparable to atoms made up of neutrons, protons and electrons. The basic building blocks can be shared and enhanced to form new *kels* during social interactions or in knowledge processing machines.

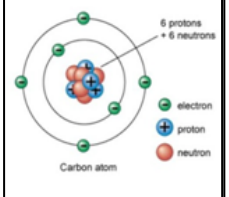




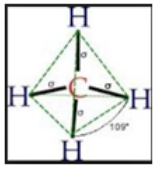
The Structures of Gold (Au) and Hassium (Hs) Atoms

Fig. 2. The structures of the Gold (Atomic weight = 196.966) with 2,8,18,32,18,1 electrons in an Au, atom and then the radio-active Hassium (Atomic weight 277) with 2,8,18,32,32,14,2 electrons. These elements have radically different properties. The *kels* in Fig. 1 are comparable to atom made up of electrons, protons and neutrons. The basic building blocks can be shared and enhanced to form other elements or during chemical interactions/radio-active and or forced processes as much as *kels* are altered in social/cultural and/or hostile interactions.

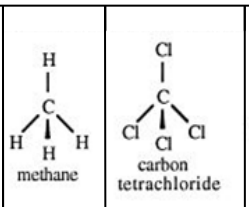
The Behavior of a Carbon Atom in Interaction with Hydrogen Atoms to form various Molecules



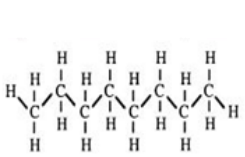
(i) A Carbon Atom a bond angle Alkane of 109.5°



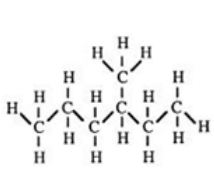
(ii) Methane



(iii) CH_4, CCl_4 and C_2H_6 Structures,



(iv) With tetrahedral bond angle of 109.5°,



(v) A Branded with chain

Fig. 3. The Alkane (C_nH_{2n+2}) Family (Methane, Ethane, Propane, Butane, Pentane, Hexane, etc.) and the adaptive role of the Carbon Atom (C).

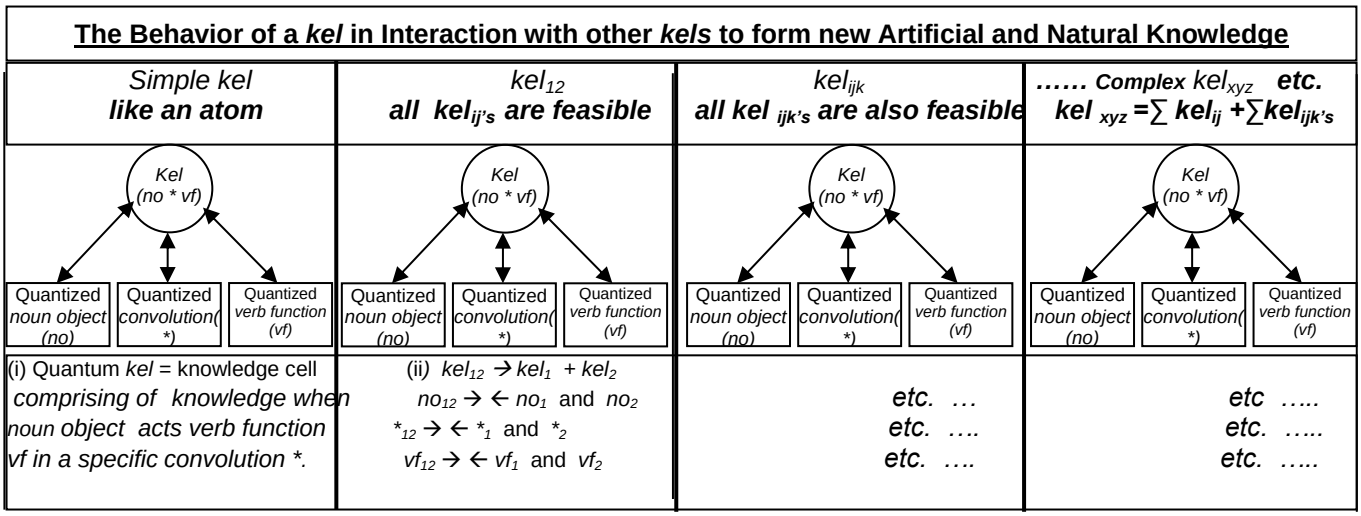


Fig. 4. The chain of new knowledge structures generated when a basic *kel* (such as the knowledge in a invention (e.g., 2-D computer memories)) starts to interact other *kels* such as 2½-D memories to leading to the Architectures of 3-D memories. Numerous other examples also exist such as the discovery of Penicillin by Fleming has led to the development of other specific chain of antibiotics, such as the invention of internal combustion engine has led to the turbo charged automobile engines, etc.

Hence, it becomes necessary to limit the definition of *kuantum* to "sensible" size and to be practical locations in setting the object-size of the *kuanta*, the size of the verb-function to be discernible and type of convolution (*) to be in the realm of human comprehension. Only the unique combination of these three "kuants" constitutes the *kels* in its own particular setting at a given instant *'t'*.

Initially the *kuantum* of knowledge can be limited to most useful noun objects and verb functions. Two examples follow. In a down to earth format, a *kuantum* of knowledge can be stated as (food (*n*), eat (*v*), restaurant (*x, y, z*), date and time (*t*)). At the other extreme, a cosmic *kuantum* can be stated as (space-ship A (*n*), explores (*v*) and coordinates- Planet B (*x, y, z*), cosmic calendar date and time (*t*)). The need to be practical and limit the programming complexity, it becomes a necessity to deal with kuantized knowledge within the realm of computation. Even so, the content of the knowledge so gathered (i.e., the food eaten in the restaurant or the data collected by the space ship) is not communicated in this representation. The flow of the entirety of knowledge needs more numerous smaller *kuanta* (*kco*'s) to be complete by the global *kuanta* of knowledge (or *KCO*)

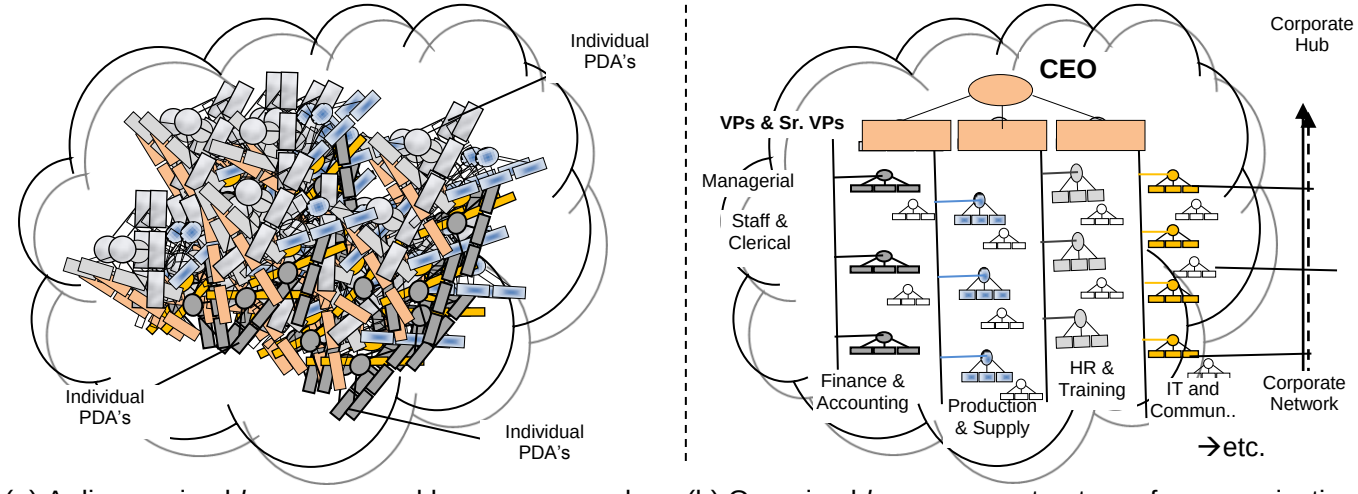
The recent changes in the Internet age are catalyzed by gating functions in the silicon chips and wave mechanics of photons in the optical fibers. This unprecedented synergy in silicon-based computation with glass-based communication has elated the human thought to new levels of intellectual activity and scientific exploration. The mental processes still hold an almost mystical execution of neural programs to mould concepts, knowledge and wisdom with learning, behavior and adaptation. Machines to implement such functions are just appearing in the society.

Even though thought processes are associated with neural space, the computational processes are associated with physical and Pentium space [8]. These intermediate linkages bridge reality and physical spaces with the human psyche dealing with objects, their actions, interactions and their effects. Human beings have learned to cross these spaces readily by mind and thought control, a wink, or even a gesture of the face. Such fine processes are hard, if not impossible to program in the software of social machines. Quantized knowledge between human minds and machines can be established by controlling the quantized noun-objects, the convolutions, the verb function, and their timings. These four entities makeup up the computational space as the mind would alter them in the psychological space to accomplish most social functions or processes. The quantized social machine would alter the status of the elemental noun-objects and their entropies accordingly. Thus, the machine could in a limited sense track, follow and duplicate the minute mental and psychological processes of a human mind at a quantum level.

A. *Atomic and Molecular Weights from Chemistry*

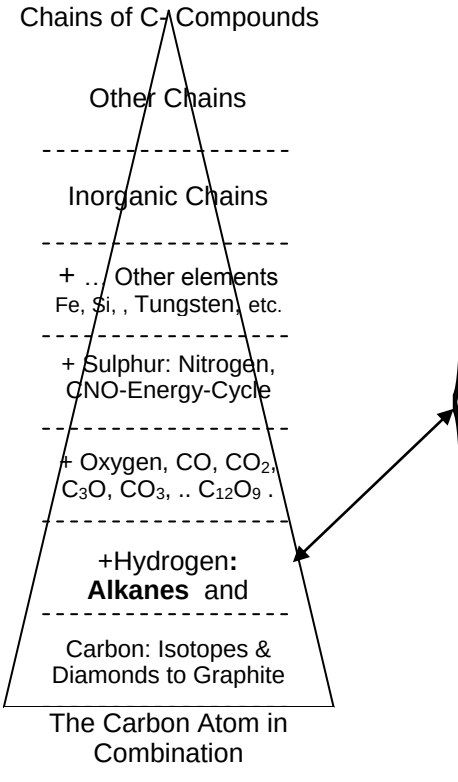
Atomic weight consists of three weights, weights of the protons, neutrons and electrons. Thus, the heavy metals have a more complex atomic structure than the higher metals. Similarly, complex compounds can be substantially heavier than simple molecules. For example, the atomic structure of a Gold atom (atomic weight of 197) has 79 Protons, 118 neutron and 112 electrons in 7 Electron shells [7]. The molecular weights of compounds also exhibit similar characteristics.

The Hassium atom formed during radio-active fusion exhibits fundamentally different properties from those of Gold, Carbon or even Lead. *Kels* also "genetically" inherit properties based on the type and nature of the *kenergy* that was expended in generating these *kel*-elements. Humans and animals may have common physiological functions have different "genes of knowledge" to make them radically different.



(a) A disorganized *kco* e.g., an ad hoc group people (b) Organized *kco* e.g., an structure of an organization

Fig. 5. Formation of an knowledge centric object *kco* form a set of *kels*. A *kco* or a *kel* is a human being with its own personality (a noun objects, no) functional capabilities (convolutions *) and unique tasks (verb functions *vf's*). These three constituents can be further fragmented to ascertain the appropriateness of the *kels*.



Alkanes Only

Six Basic Alkanes	Molecular Weight ɤ	Gross Energy ɜ = kJ/mol
Methane CH_4	16.04 g/mol	889
Ethane C_2H_6	30.07 g/mol	1560
Propane C_3H_8	44.16 g/mol	2220
Butane C_4H_{10}	58.12 g/mol	2877
Pentane C_5H_{12}	72.15 g/mol	3507
Heptane C_7H_{16}	100.20 g/mol	≈ 4824
Any Allkane C_nH_{2n+2}	----	----

a. Notes: ɤ The numbers are approximate, since the atomic weight of H is 1.00789 and the standard atomic weight of C is 12.011.

b. ɜ The quantity known as higher heating value (HHV[4]) (or gross energy or upper heating value or gross calorific value (GCV) or higher calorific value (HCV[5])). It can also be expressed as MJ/kg.

Fig. 6. The properties the carbon atom as it forms compounds with other elements, H, O, N, etc.

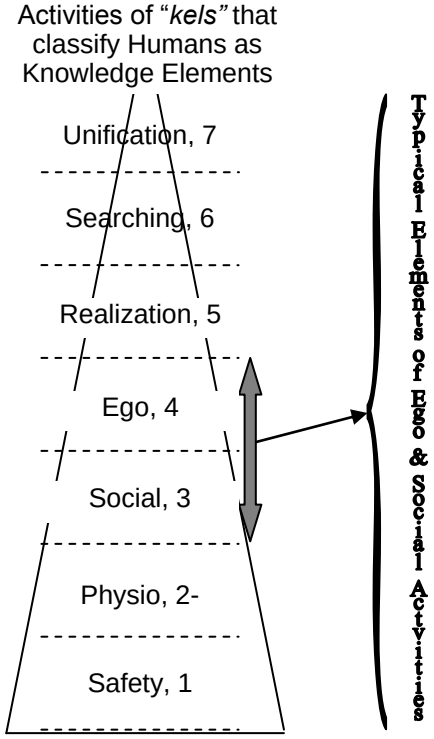
4 is determined by bringing all the products of combustion back to the original pre-combustion temperature, and in particular condensing any vapor produced. Such measurements often use a standard temperature of 25 °C (77 °F). This is the same as the thermodynamic heat of combustion since the enthalpy change for the reaction assumes a common temperature of the compounds before and after combustion, in which case the water produced by combustion is liquid.

5 The higher heating value takes into account the latent heat of vaporization of water in the combustion products, and is useful in calculating heating values for fuels where condensation of the reaction products is practical (e.g., in a gas-fired boiler used for space heat). In other words, HHV assumes the entire water component is in liquid state at the end of combustion (in product of combustion) and that heat below 150 °C can be put to use.

In Fig. 6, the Carbon atom and its molecules are used to indicate the chain of compounds derived from Carbon atoms on the left side. Carbon atoms combine with other elements, and metals to form elaborate arrays of compounds. The alkane chain is used to depict the molecular weights on the right side. The molecular weights in g/mol increase as the chain of hydrocarbons becomes longer in column 2 and the energy contained expressed as in kJ/mol also increases. As seen in the Sections B and C, and depicted in Fig. 7, kels and kco's also exhibit similar properties.

B. Atomic/Molecular Weight of Kels in Society.

Kel atomic/molecular weight consists of three (*kel*) atomic weights (a) *no* (or *no's*), * or (*'s) and *vf* or (*vf's*), thus complex or chained *kels* such as a surgeon (a *no*) performing a surgery, can be substantially heavier than simple *kels* such as a monkey (*no*) eating (*vf* and * together), peanuts (secondary noun object). *Kel* atomic/molecular-weights can be positive for constructive knowledge elements enhancing utility (such as *X* helps *Y*) or zero (such *X* does nothing to/for *Y*) and even negative (such as *X* hurts *Y*), for non-constructive or destructive knowledge elements decreasing utility (such as *X* bothers *Y*). The three components (*no (no's), * (*'s)* and *vf, (vf's)*) all determine the utility. In a sense, human values in the society and culture are ingrained in utility. If construction, reconstruction and peace are on the positive scale, then destruction, terrorizing and war are on the negative scale. Thus, the *kel* balance can swing and fluctuate with time and social setting. Nations have examined this abstract notion by examining the extent of knowledge that propagates health, happiness and welfare in the society to the extent of Mafia, war and terrorizing knowledge disintegrated over a finite duration of time such as the Presidency of US Presidents. The measure though not precise is still indicative of the utility of any President for the country. Documented periods of war (Churchill (WWII), Nixon and Johnson (Vietnam war) and Bush (Iraq war) Presidencies) are disfavored in comparison with the years of reconstruction and social reform that followed such Presidential years engaged in social reform, public and global welfare and other constructive actions (verb functions *vf's*) bear high positive utility for the President.



A particular sample (considered as a ***kel***) drawn from a given

Some Basic Elements in 3 and 4	Mean & Variance [x] from Populous	Satisfaction [ɜ] = Achievement X Years
Wealth	*Personal Pref.* = P_w **Mean** = μ_w Variance=σ_w	$S_w = P_w \cdot \mu_w \cdot Years_w$
Power	*Personal Pref.* = P_p **Mean** = μ_p Variance=σ_p	$S_p = P_p \cdot \mu_p \cdot Years_p$
Fame	*Personal Pref.* = P_f **Mean** = μ_f Variance=σ_f	$S_f = P_f \cdot \mu_f \cdot Years_f$
Status	*Personal Pref.* = P_s **Mean** = μ_s Variance=σ_s	$S_s = P_s \cdot \mu_s \cdot Years_s$
Prestige	*Personal Pref.* = $P_{p'}$ **Mean** = $\mu_{p'}$ Variance=$\sigma_{p'}$	$S_{p'} = P_{p'} \cdot \mu_{p'} \cdot Years_{p'}$
Respect	*Personal Pref.* = P_r **Mean** = μ_r Variance=σ_r	$S_r = P_r \cdot \mu_r \cdot Years_r$
Integrated Sum of Achievements of an individual.	Dynamic and Society/Culture Dependent	***Total Achievement*** $S_t = \sum S_i$ $i = w, p, f, s, p', r$

Notes: [x] The numbers are approximate, and based on statistical Averages of wealthy and successful segment of the population at any given time frame or decade in any given culture/society.

[ɜ] The satisfaction or integrated achievement of *kel* can be considered as the sum of individual achievements and the duration over which they last. The personal preference factors (P_w, P_p, P_f, P_s, $P_{p'}$, and P_r) are also dynamic but indicative of the individual's personality profile. There is no quantitative measure for satisfaction and happiness but it can be a perceptual entity that the *kel* (individual) can "feel".

Fig. 7. The properties *kels* and *KCOs* as they forms new combinations with other traits (such as *loving* and *kind* → *considerate*) in the Social domain. These properties are futher explained Sections B and C.

C. Statistical Properties of kels and KCOs in Society

Kels those resident in human beings for long periods of time substantially shape the personality of the host. For example, a human being (*no*) with a subject matter specialty in physics and teaches (* and *vf*) it for decades, becomes a physics teacher (a *KEL* or *KCO*). Other examples are also evident. For this reason, the evolution of a *kel* to a *KCO* becomes evident in almost all circumstances and situations. In the case of inanimate *kels*, petroleum in gasoline becomes petrol. The terminology becomes less important than the evolutionary chain of *kels* to *KELs*, and then on to *kcos* and *KCOs*.

Complex *KELs* in large associations with other *kels* have high "molecular weights". For example, a highly sociable person or a subject matter expert will have higher "mo weight" than an introvert or a high school student. Such *kels* can be classified according to their "mo weights". The highly valuable *kels* also at the top of a hierarchical structure gratify the most wanted human and social needs. If such needs are themselves classified (as in Maslow's Need Pyramid), then the *kels* to gratify these human needs, can be rearranged accordingly. The *kels* that satisfy the realization, social, and ego[6] needs (from Maslow's Hierarchy) of humans and societies will have their highest *kel*-atomic/molecular weights. The diagrammatic arrangement of Needs, their *kels* are shown in Fig. 7.

V. Conclusions

We have proposed that knowledge should be considered reducible into their finest quantum sized elements. The quantized elements of knowledge behave as elements in chemistry and constitute the building blocks of larger bodies of knowledge, much as the elements in nature combine to become compounds and molecules. In the knowledge domain, the constitution of *kels* and their behavior is dramatically more flexible and individualistic, but exhibit statistical properties that makes communication (exchange of knowledge) possible across social and cultural barriers. In this paper, we trace the similarity between the elements of knowledge and elements in chemistry. It is feasible only to a certain extent since the structure and modality of *kels* becomes radically different than those for the elements in chemistry. In the later case, the Periodic Tables precisely and rigidly dictate the properties and behavior of chemical elements.

In the knowledge domain, the syntactic and semantic laws the *kel* composition for the exchange of knowledge depend on the individuals, society, culture, time and the information content in the knowledge being exchanged. The capacity of the modern computers and hand held devices is by and large sufficient to offer individual users pathways and byways through the knowledge domain to deal with the exchange of information precise, optimal and efficient. In this vein, we suggest that choice of their particular elements of knowledge of individual users be towards the achievement of their long-term goals like wealth, status, power, etc.

[1] It is hard to justify that an egotist would be classified as a highly placed *kel*, unless the ego also serves a molecular association with other beneficial *kels*. As another example, a Mafia boss, though well connected with other members of mafia cult would have a high negative mol-weight. It becomes necessary to associate the social welfare with mol-weights to be positive. In the current social setting, leaders such as Gandhi, Carter and King would have a highly rank positive in the hierarchy. Negative mol-weights are and should be associated with torrents, terrorists and dictators such as Mao in China, Hitler in Germany, Johnson in Vietnam, Bush in Iraq, Netanyahu in Palestine who have brought shame to humankind.

REFERENCES

[1] Syed V. Ahamed and Sonya M. Ahamed "Flow of Knowledge: Part A- Conduction Theory of Knowledge Flow" , Companion Paper

[2] Syed V. Ahamed and Sonya M. Ahamed "Flow of Knowledge: Part B- Transmission Theory of Knowledge Flow" , Companion Paper

[3] Syed V. Ahamed and Sonya M. Ahamed "Flow of Knowledge: Part C- Kuantum Theory of Knowledge Flow" , This Paper

[4] Syed V. Ahamed and Sonya M. Ahamed "Flow of Knowledge: Part D- Inspiration Theory of Knowledge Flow" , Companion Paper

[5] OCLC, Dewey Decimal Classification and Relative Index, 22nd ed., OCLC, Dublin, OH, 2003. See also, J. P. Comaroni, Dewey Decimal Classification, 18th ed., Forest Press, Albany, NY, 1976.

[6] United States Government, Library of Congress Classification, <http://catalog.loc.gov> URL accessed June 2003.

[7] Los Alamos National Laboratory, "periodic tables of Elements", http://periodic.lanl.gov/index.shtml, Accessed March 2015.

[8] Wikipedia, "List of Intel Pentium Processors", http://en.wikipedia.org/wiki/List_of_Intel_Pentium_microprocessors, Accessed March 2015.